Dragon, Karen E. (CDC/NIOSH/EID)

From: valerie Dabas <valeriedabas@hotmail.com>
Sent: Monday, February 13, 2012 11:07 AM
To: NIOSH Docket Office (CDC); Middendorf, Paul (CDC/NIOSH/OD)
Subject: Reports by RJ Lee
Attachments: 120 Liberty Street.pdf; WTC dust Evaluation.pdf

Damage Assessment
130 Liberty Street Property

Report Date: December 2003

WTC Dust Signature Report
Composition and Morphology

Summary Report

Prepared by:

RJ Lee*Group*, Inc.

350 Hochberg Road
Monroeville, PA
15146

Prepared for:
Deutsche Bank

Table of Contents

List of Figures

List of Tables

WTC Dust Signature Report:
Composition and Morphology

1.0 Summary

The World Trade Center destruction commencing on September 11, 2001 ("WTC Event") physically destroyed significant portions of the interior and exterior of the building located at 130 Liberty Street, New York, NY (the "Building"). A gash was created in the north side of the Building; the plaza in front of the Building was crushed which exposed the Level A and Level B Basement areas and the first floor; approximately 1,500 windows were broken; and the Building was exposed to the elements as well as being filled with a combination of soot, dust, dirt, debris, and contaminants. For a period of time following the WTC Event, the Building owner, Deutsche Bank Trust Company Americas (the "Bank"), was precluded by the City of New York from entering the Building. After the Bank gained access to the Building, the Bank retained the services of engineering firms to assess the physical damage. Additionally, an environmental firm was retained to conduct limited sampling for asbestos, heavy metals, and biological contaminants.

In April of 2002, RJ Lee Group was retained by the law firm of Pitney Hardin Kipp & Szuch LLP, on behalf of the Bank, to oversee and investigate the presence, type, amount, and extent of environmental contaminants in the Building and to recommend remediation strategies. The findings set forth in this report are based upon RJ Lee Group's review of the results of its own extensive set of analyses, its background, experience, and education in this area, as well as its study of recognized scientific literature.

1.1 Investigation

The collapse of a major building can produce significant quantities of dust and debris comprised of the construction materials and the contents of the building. Fires in commercial office buildings can produce combustion products including soot, partially combusted aerosolized particles and organic vapors. The amounts and portions of the various products of combustion will depend upon the source materials, the combustion temperatures, the availability of oxygen and other oxidants, the duration of the fires, and other factors. The WTC disaster uniquely combined several cataclysmic destructive processes in a single event. This report evaluates the features of the WTC Dust and WTC Hazardous Substances deposited in the Building as a result of the collapse, ground impact, fires, pressure forces, and other phenomena arising from the WTC Event.

As a result of this investigation, it was determined that WTC Dust contains various solid phases that include asbestos and minerals, metals and mercury,

organic pollutants and particles of various sizes and different morphological characteristics. The distinctive composition, solid phases, and unique morphological features have allowed for the development of a "WTC Dust Signature": dust containing particles that, when occurring together, can be considered to act as identifying source tracers. The WTC Dust Signature can be compared with dusts of unknown provenance using conventional source apportionment methodologies, forensic tags derived from microscopic observations, or statistical analysis. These techniques are a scientifically recognized methodology used to determine source impact by comparing dust from an unknown source to reference source signatures. In this case, the dust of unknown origin can be compared to the WTC Dust Signature to determine what component or fraction of the material is the result of the WTC Event.

To evaluate the validity of the WTC Dust Signature as a unique identifier, dust samples were collected from a number of representative office buildings, "Background Buildings", in typical urban locations including Midtown Manhattan, New York City, NY, Washington, D.C., Pittsburgh and Philadelphia, PA, and Florham Park, NJ. See RJ Lee Group "Background Levels in Buildings" report. Additionally, dust samples collected from the New York City area collected and analyzed prior to 9/11/2001 were reevaluated. The pre-WTC Event samples, collected in the spring of 2000, included materials from both the interiors of the World Trade Center Towers as well as exterior samples, taken in close proximity to the Towers. The Background Building samples and the pre-WTC Event samples were compared to known WTC Dust for the forensic evaluation, using the source apportionment methodologies to determine the extent of the WTC Dust impact.

This WTC Dust evaluation represents the most extensive microscopic investigation related to WTC Dust ever performed. Over 400,000 particles were classified using SEM techniques with approximately 80,000 images collected.

1.2 WTC Event Dust Constituents

Building materials from which the WTC Towers were constructed include structural steel, asbestos-containing insulation material, other insulating fibrous material (mineral wool and glass fibers), cement and aggregate (concrete), wallboard, ceiling tiles, ducts, wiring, paint, plate glass, and other components. Building contents of the WTC included computers and other electronic equipment, fluorescent lights, furniture, office supplies, and a myriad of other items. The brittle and friable components of these materials were pulverized during the collapse and the combustible components were partially burned in the ensuing fires.

The catastrophic structural collapse of the WTC resulted in coarse fragmentation as well as fine particle dust generation including asbestos and various chemicals of concern. The hazardous materials in the dust originated from many common sources. The National Resources Defense Council (NRDC) report estimated more than 1.2 million tons of building materials collapsed during the WTC Event containing an estimated 300 to 400 tons of asbestos. (NRDC, 2002) Additionally, 50,000 personal computers were destroyed, with each containing approximately 4 pounds of lead. (NRDC, 2002) Additionally, thousands of fluorescent light bulbs, thousands of light switches and other mercury-containing items were destroyed, releasing thousands of grams of mercury into the surrounding environment. These materials, properly contained and applied in their consumer products and form, presented no particular environmental or health hazard. It was, however, the pulverization of these items caused by the WTC collapse that liberated and rendered them bio-accessible, thus creating an environmental hazard.

The conflagration activated processes that caused materials to form into spherical particles such as metals (e.g., Fe, Zn, Pb) and spherical or vesicular silicates or fly ash. The heat generated during the WTC Event caused some plastics to form residual vesicular carbonaceous particles, and paints to form residual spherical particles. Some metals, plastics and other materials were vaporized thus producing new chemicals that were deposited onto the surfaces of solid particulate matter, such as asbestos, quartz, and mineral wool. These dust and heat-processed constituents are not typically found associated with typical office building environments. To prove that the Building has been contaminated with the fallout from the WTC collapse, RJ Lee Group undertook a statistical sampling approach in collecting samples from various regions of the Building and analyzed them for the types and levels of contaminants.

1.3 Testing Protocol

Samples were collected from the Building beginning June 08, 2002 using "TP-01: Protocol for the Monitoring of Non-Biological Indoor Environmental Contaminants at 130 Liberty Street" dated May 10, 2002. Samples were also collected from Background Buildings beginning February 04, 2003 using the general guidelines of TP-01, Interior Spaces. Sampling kits were taken to each predetermined location for sampling. Sampling kits, each containing media for eight samples, were taken to each predetermined grid location for sampling. Each kit contained:

- Asbestos Wipe
- Silica Microvac
- Metals Wipe

- Mercury Wipe
- Dust Lift
- PNAs Wipe
- PCBs Wipe
- Dioxins/Furans Wipe

The sample location selection procedures involved and a summary of the statistical analysis are set forth in the Addenda. The test protocols set forth the complete methodology and a detailed discussion of sampling design, and statistical analysis are contained in the Insurance Claim Report dated May 2003, Volume III: Statistical Analysis.

Samples were analyzed using industry standard analytical laboratory methods as follows:

- Samples were analyzed for asbestos using transmission electron microscopy (TEM) in accordance with ASTM D-5755.
- Samples were analyzed for metals in accordance with NIOSH 7300 method, using inductively coupled argon plasma (ICP) spectrometry.
- Samples were analyzed for mercury in accordance with EPA Method SW 846 7471A, using cold vapor atomic absorption (CVAA).
- Samples were analyzed for PCBs in accordance with EPA Method SW 846 8082 using gas chromatography with electron capture detectors (GC/ECD).
- Samples were analyzed for PNAs in accordance with EPA Method SW 846 8270C using gas chromatography with mass spectrometry (GC/MS).
- Samples were analyzed for dioxins/furans in accordance with EPA Method SW 846 8290 using gas chromatography with high-resolution mass spectrometry (GC/HRMS).
- Samples were analyzed for particle characteristics using scanning electron microscopy (SEM), coupled with energy dispersive spectroscopy (EDS) techniques.
- Samples were analyzed for silica using X-ray Diffraction (XRD) in accordance with NIOSH 7500 and NIOSH 0600 methods.

1.4 Findings

Detailed characterization of WTC Dust revealed that it possessed a unique set of characteristics by which it could be identified and differentiated to a reasonable degree of scientific certainty from dust that had other origins. Thus, dust that was found as a pervasive contaminant in the Building was unequivocally identified as coming from the WTC Event. The conclusions reached in this report regarding dust found in the Building are as follows:

- Particulate with the WTC Dust Signature was observed throughout the Building.
- The identity, concentration, and characteristics of the particles and the chemical composition of the WTC Dust constitute a complex, recognizable pattern or "signature."
- The identification of WTC Dust is not based on an individual characteristics, but rather on a profile comprised of the WTC Dust Markers.
- The presence of WTC Dust in a sample of Building dust can be established using conventional forensic and statistical methodology with a high degree of scientific certainty.

The analytical results are as follows:

- Chrysotile asbestos was pervasively present in the Building. The WTC towers were built, in part, using fireproofing materials that contained chrysotile asbestos. In contrast, the Building was not constructed with asbestos-containing surfacing materials. Chrysotile asbestos is a distinguishing WTC Dust Marker for WTC Dust.
- Mineral wool was pervasively present in the Building. Mineral wool is a WTC Dust Marker for WTC Dust. The WTC towers used construction materials that contained mineral wool.
- Gypsum, also designated as a WTC Dust Marker for WTC Dust based on its high abundance and small particle size (not its mere presence), was ubiquitously present in the Building.
- Particles of partially burned or melted plastic (vesicular carbonaceous particles), not expected in "normal" dust, were commonly observed in WTC Dust due to the fire that accompanied the WTC Event. Additionally, the concentrations of various burned phases and the characteristics of specific phases, also proved to be excellent "fingerprints" for WTC Event dusts.
- Particles of materials that had been modified by exposure to high temperature, such as spherical particles of iron and silicates, are common in WTC Dust because of the fire that accompanied the WTC Event, but are not common in "normal" interior office dust.
- The investigation has established that WTC Dust is a carrier of toxic substances.

To facilitate the comparison between WTC Dust and typical background dust, the respective dust constituents based on SEM data were plotted on a "ternary" diagram and data was grouped into three distinct classes to reflect differences in origin (**Figure 1**).

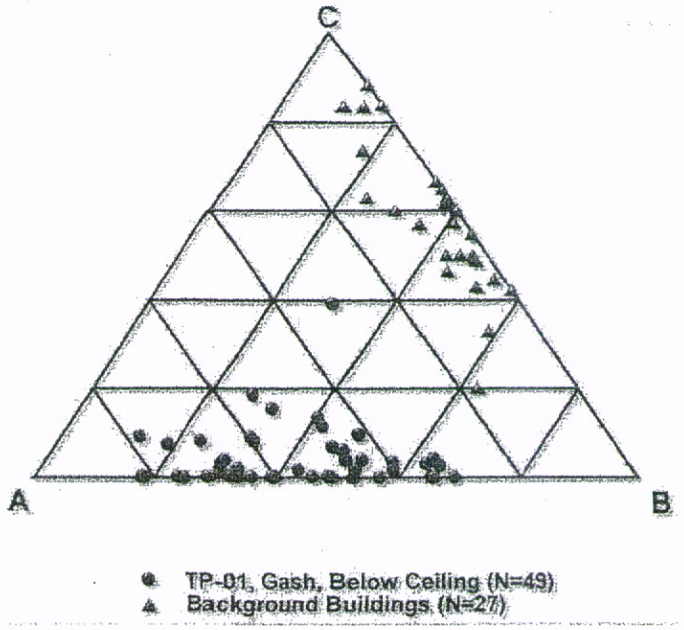


Figure 1. Ternary plots of TP-01 *gash* below ceiling and Background Building samples.

Class A consists of the major building materials and particles influenced by high temperature. These particles include characteristic particulate derived from the WTC Event. Class B consists of carbonate and silicate minerals. These are commonly derived from soil, but also represent building materials and could have been derived from the WTC Event. Class C consists of carbon-rich materials. This class includes fibers, flakes, or particles representing hair, cellulose, pollen, skin flakes, and other biological components. These particles represent a major portion of common Background Building dust.

The composition, as observed in **Table 1**, shows that the dust collected from the Background Buildings which were not affected by the WTC Event is considerably different than that collected from the Building. These Background Building samples were dominated by the carbon-rich occurrences supplemented by the aluminosilicate components commonly derived from soil. These results show that the samples collected within the Building are distinctly different in composition and were derived from a different type of source than the dust from the Background Buildings.

Table 1. Average concentrations of analytes in WTC Dust and Background Building dust

Analyte	Units	WTC Dust[1]	Background Building dust
Asbestos	(s/cm^2)	2,255,433	107
Barium	(ug/ft^2)	232	0.419
Beryllium	(ug/ft^2)	1.32	0.025
Cadmium	(ug/ft^2)	27	0.187
Chromium	(ug/ft^2)	152	0.571
Copper	(ug/ft^2)	741	1.64
Lead	(ug/ft^2)	424	0.325
Manganese	(ug/ft^2)	693	0.567
Nickel	(ug/ft^2)	48	1.17
Mercury	(ug/ft^2)	1.81	0.466
Dust	(g/m^2)	8.62	0.002
PCB	(ug/ 100 cm^2)	0.048	0.002
PNA	(ug/ 100 cm^2)	2.91	0.001
Quartz	(g/m^2)	0.252	<0.001
Dioxin/TEQ	(pg/ 100 cm^2)	51	0.000
Zinc	(ug/ft^2)	24,614	7.40

As described above, the typical office dust is composed heavily of organic and other carbon-rich particulate materials. WTC Dust, conversely, contains very little pristine organic fibrous or particulate material. Much of the organic or polymeric content of the WTC Dust has been heat hydrolyzed and partially consumed or burned. Therefore, a residual vesicular type of carbonaceous component persists in the WTC Dust. In addition to the vesicular carbon components, the high heat exposure of the WTC Dust has also created other morphologically specific varieties of particulate matter including spherical metallic, vesicular siliceous and spherical fly ash components. These types of particles are classic examples of high temperature or combustion by-products and are generally absent in typical office dust.

[1] Interior Spaces data (TP-01)

2.0 WTC Dust Composition

A variety of analytical methods were used to characterize the dust collected from the Building and to develop an understanding of the composition of WTC Dust. The analytical techniques discussed in this report including optical microscopy (reflected and transmitted light), scanning electron microscopy (SEM) with associated energy dispersive spectroscopy (EDS) and X-ray Photoelectron Spectroscopy (XPS) were utilized during the evaluation of the dust samples. A variety of particle compositions and morphologies were identified during this analytical sequence that aids in differentiation of the Building dust samples from the Background Buildings. The following discussion sets forth the major analytical results from the SEM/EDS characterization:

2.1 Background Dust Characteristics

An important aspect of the characterization of WTC Dust is the ability to distinguish WTC Dust from "background dust", i.e., particulate matter that is typical in a normal office environment. This section discusses the analytical results from efforts to define the composition, morphology, and abundance (particle loading) of background or typical office environmental particulate content. (See RJ Lee Group's *Background Levels in Buildings* report, December, 2003)

Typical interior office dusts possess a different morphological and mineralogical character from those that generated produced from the WTC disaster. For example, many of the components typically associated with office dust are internally generated by daily activities within the facility. One of the largest contributors to the typical environmental particulate population is the occupying personnel. Indoor dust commonly consists of skin flakes, hair, natural and synthetic textile fibers, plant and insect parts, windblown soil-derived dust (silicate minerals), and various amounts of other materials.

Carbonaceous particulate and fiber components comprise a significant portion of the typical office dust population. This description is based upon knowledge of indoor air quality and the analysis of numerous background samples and other research performed over the course of many years. An understanding of the characteristics of typical office dust is critical to the development of a WTC Event driven dust signature because it allows the identification of uncommon constituents in the dust.

Typical interior office dusts are sparsely distributed on surfaces compared to the heavy loading of WTC Dust in the Building. The environment in a typical office complex is subjected to significant amounts of control and conditioning such as filtering, heating and various distribution techniques. The environment within the Building was rendered completely uncontrolled

due to the unhindered access of dust, debris and moisture through the *gash* and through numerous broken windows

Figure 2 shows a typical loading on a lift sample collected from a Background Building and **Figure 3** shows the particle loading of a lift sample collected from a WTC Dust impacted location within the Building. The images in these figures depict the same magnification. The shear amount or dust loading differential between the two samples is obvious. At higher magnifications, it can be seen that materials residing on the WTC Dust lifts possess morphological characteristics that are different from the Background Building samples. The particulate components on the WTC Dust sample appear angular or pulverized and accompany spherical heat affected particles. Also, the fibrous component exhibited in the WTC Dust sample is largely absent from the Background Building sample.

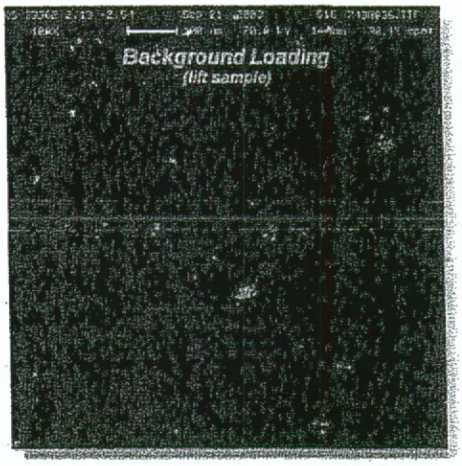


Figure 2. Typical dust loading on Background Building samples

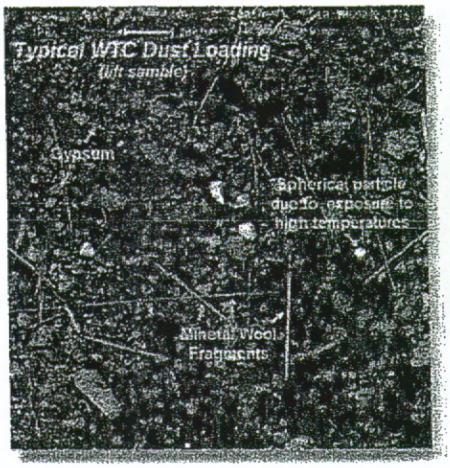


Figure 3. Dust loading from a WTC Dust impacted location

Figure 4 shows examples of the organic components that comprise a significant portion of the total particulate and fibrous material associated with the Background Building samples. This type of matter comprises only a trace amount within the WTC Dust. The WTC Dust contains hydrolyzed or partially consumed components of carbonaceous material exhibiting a vesicular typically sub-spherical morphology.

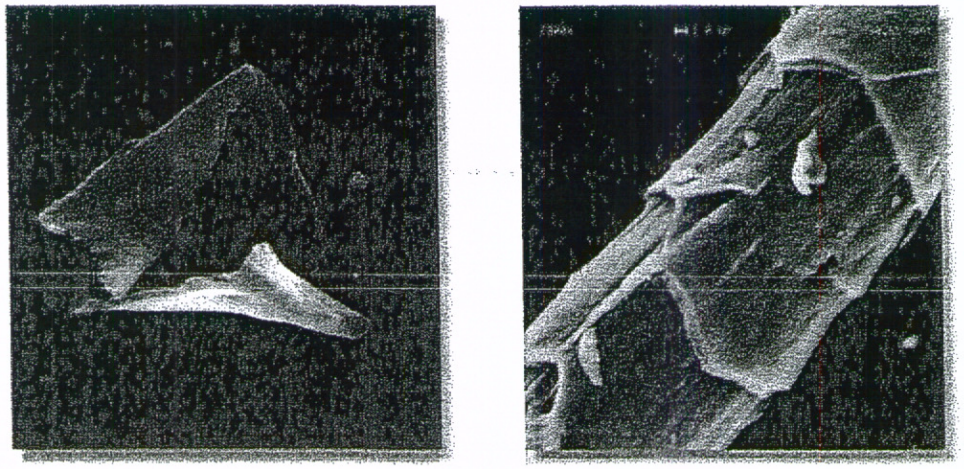


Figure 4. SEM image of skin flake and a hair fiber found in Background Buildings.

2.2 Pre-WTC Event Dust Characteristics

Samples collected within the WTC towers in the spring of 2000 were examined to provide further evidence of the particle types expected within buildings surrounding the WTC site prior to the WTC Event. **Figure 5** and **Figure 6** include SEM images of "typical" dust particles that were indicative of the particles types present at the WTC site prior to the WTC Event. The left image of each photomicrograph shows a field of view with a white box. The right image is at a higher magnification and is the region within the box of the left image. The lower portion of the figure shows the elemental spectrum acquired inside the small box seen in the right image. These background particles include common soil/mineral particles such as quartz, clays and even rust particles.

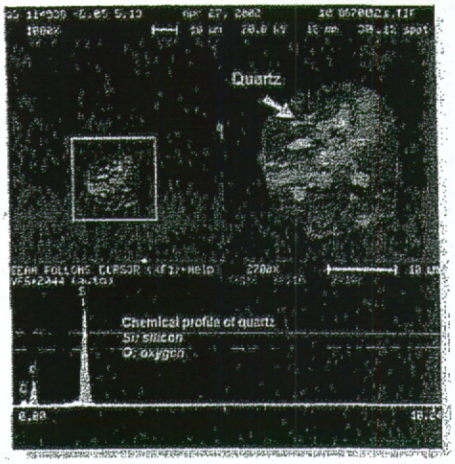


Figure 5. SEM image with EDS of silicon-rich particle (i.e., quartz)

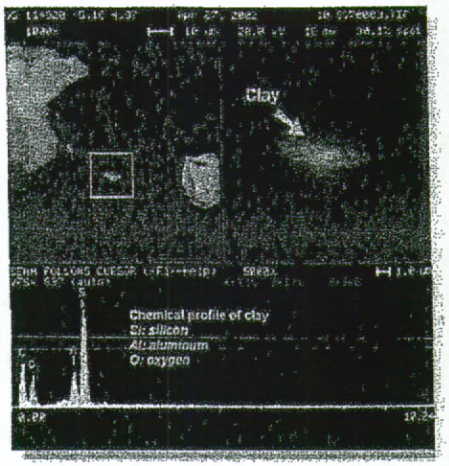


Figure 6. SEM image with EDS of silicon/aluminum-rich particle (i.e., clay).

2.3 WTC Dust Characteristics

2.3.1 Chrysotile Asbestos

Chrysotile asbestos was found to be a consistent component of the WTC Event contamination. Chrysotile was used in a number of applications at the WTC. For example, some of the lower floors of WTC-1 (North Tower) contained fireproof coatings that were sprayed onto structural steel and ceilings above and below each mechanical equipment floor. Elevator shafts were covered with a 90% chrysotile cement. Many floors in the WTC Towers were covered with vinyl asbestos resilient flooring. The NRDC report indicated that more than 300 to 400 tons of asbestos was present in the WTC buildings.

Chrysotile asbestos was positively identified in the WTC prior to the WTC Event as evidenced in studies performed by RJ Lee Group in 2000 (**Figure 7**). **Figure 8** shows chrysotile asbestos associated with gypsum within the WTC Dust (post-WTC Event).

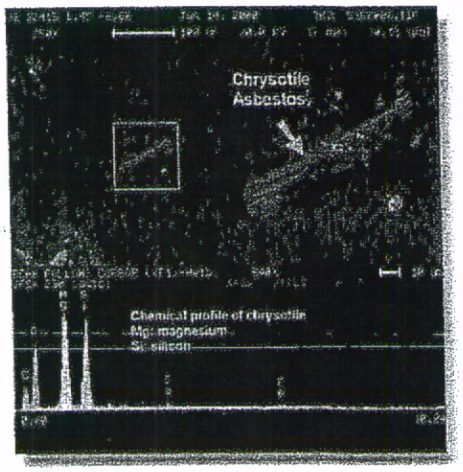


Figure 7. SEM image and EDS of chrysotile asbestos fiber bundle in WTC-1 (Pre-WTC Event)

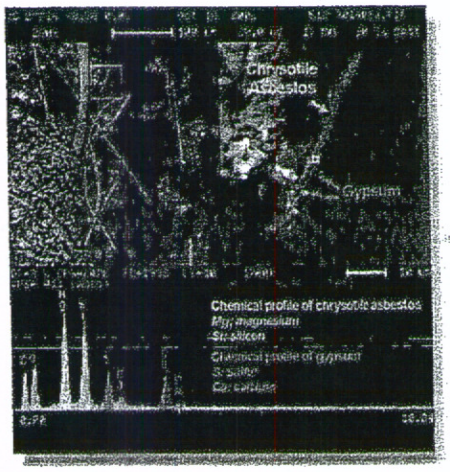


Figure 8. SEM image and EDS of WTC chrysotile with gypsum (Post-WTC Event)

As a result of the extreme forces produced by the WTC Event, the chrysotile fiber bundles within the WTC Towers were commonly broken down to thin bundles and fibrils.

Further, TEM analysis of dust in the Building also showed the asbestos concentration reaching over 70 million structures/cm² (s/cm²) in TP-01 samples from the *gash* region, directly adjacent to the WTC site. An unprecedented level of 1 billion s/cm² was also observed in the Building and 2 billion s/cm² on the roof of the Building where debris was deposited from direct fallout as well as suspension, as the WTC Event occurred.

2.3.2 Gypsum

Calcium-sulfate minerals are major constituents in building materials such as wallboard, plaster, and fireproofing. Wallboard is constructed with gypsum (calcium sulfate) and is commonly found in buildings. A significant portion of the gypsum that has been detected in the Building appeared in the form of fine dust that was pulverized to a degree not seen in ordinary building dust.

Figure 9 illustrates gypsum is coarse and fewer fine particles are observed in the pre-WTC Event debris. Figure 10 shows a typical SEM image of gypsum debris from within the WTC Dust.

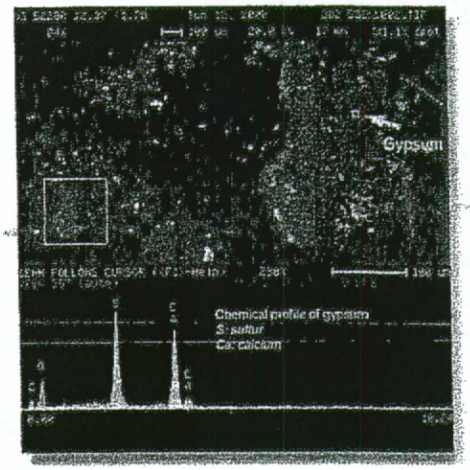


Figure 9. Image and EDS of gypsum in the WTC (Pre-WTC Event)

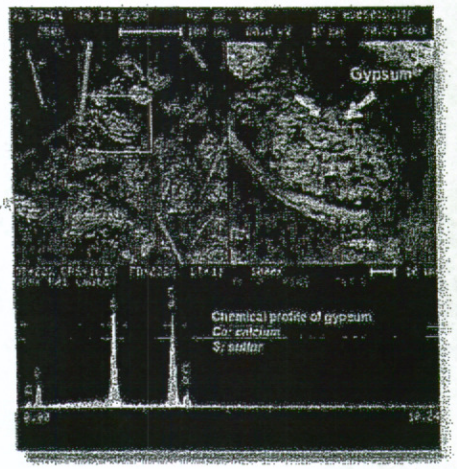
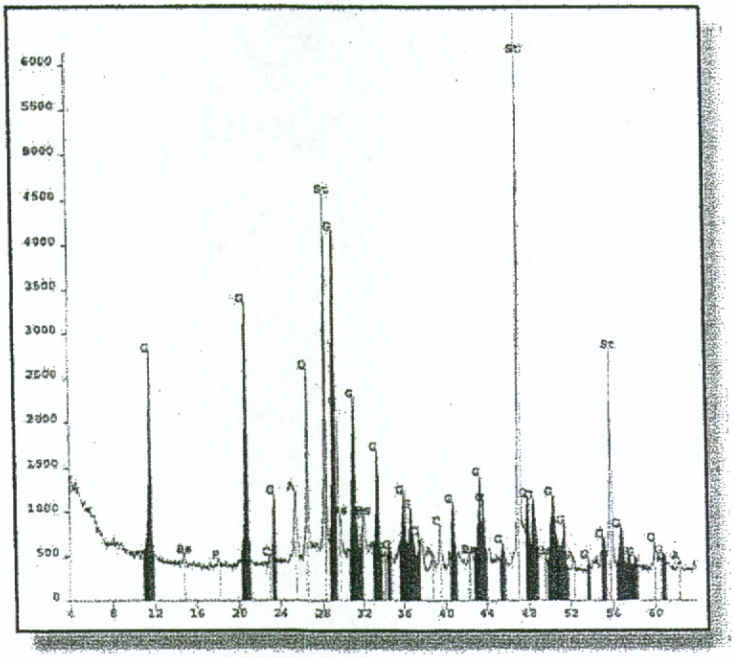


Figure 10. SEM image and EDS of WTC gypsum (Post-WTC Event)

Figure 11 shows an X-ray diffraction (XRD)[2] pattern of the bulk WTC Dust. Gypsum and other calcium sulfate phases were found to comprise up to 30% of the WTC Dust by mass. Other crystalline phases were quartz and calcite with concentrations of approximately five weight percent.



[2] X-ray diffraction allows for the quantification of crystalline phases.

Figure 11. XRD spectrum of WTC Dust.

2.3.3 Synthetic Vitreous Fibers

Synthetic vitreous fibers (SVFs) or man-made vitreous fibers (MMVF) are a class of insulating materials used widely in commercial buildings. They are made primarily from glass, rock, slag, or clay. Typical mineral wool applications include use in structural fire protection and ceiling tile. Mineral wool has also been widely reported as a major constituent of WTC Dust. Mineral wool found in Background Buildings typically existed as long fibers as opposed to the short, fractured fibers found in WTC Dust. **Figure 12** shows a typical mineral wool fiber observed in the WTC prior to the WTC Event. After the WTC Event, many of the mineral wool fibers were observed to have a short and fractured nature, which can be attributed to the catastrophic failure of the WTC as compared to normal degradation (Figure 13 through **Figure 14**).

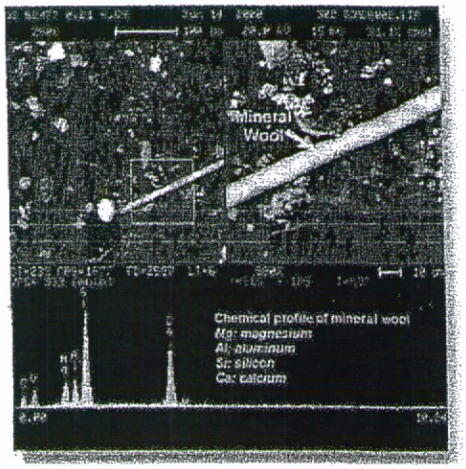


Figure 12. SEM image and EDS of mineral wool in the WTC-2 prior to the WTC Event.

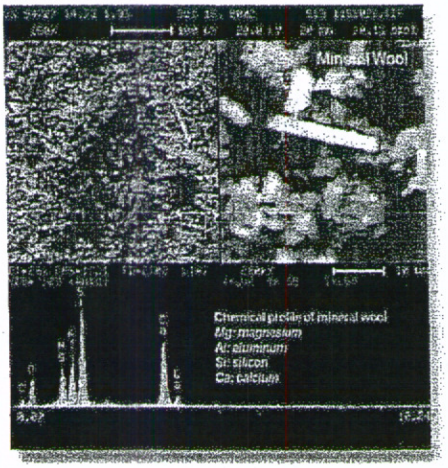


Figure 13. SEM image and EDS of WTC mineral wool fragment after the WTC Event.

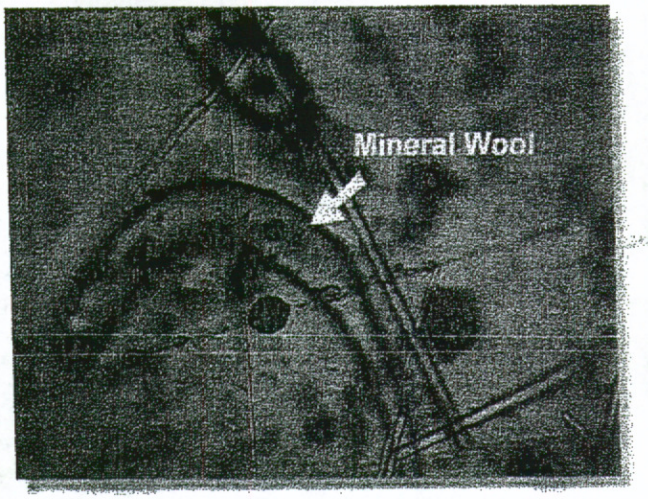


Figure 14. Optical microscopy image of mineral wool fragment.

In addition to mineral wool, fractured glass fibers are also a WTC Dust Marker for WTC Dust. The major uses of glass fibers are in thermal insulation, noise-control (acoustic) products, linings for air-handling ducts, pipe insulation and air filters. Representative glass fibers from the WTC Dust are shown in **Figure 15** and **Figure 16**.

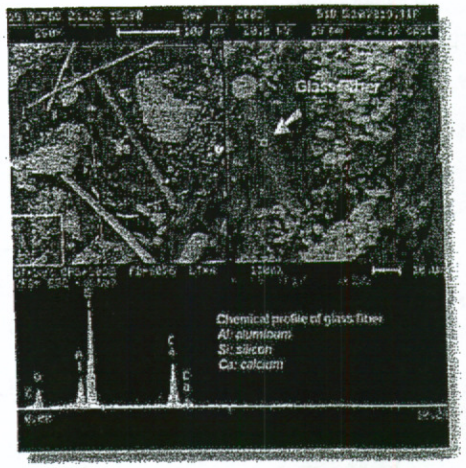


Figure 15. Glass fiber in WTC Dust

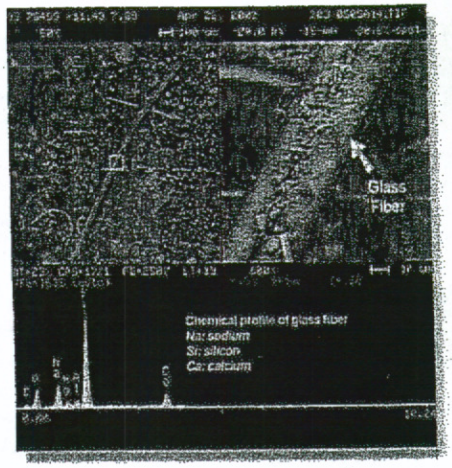


Figure 16. Glass fiber in WTC Dust.

2.3.4 Vermiculite

Vermiculite is a mica-like mineral which exfoliates (expands) on rapid heating to produce an inert, low-density material with significant thermal

qualities. The mineral does not burn and provides excellent heat resistance properties. Vermiculite was present in the plaster on exterior walls within the WTC towers and is commonly observed in the WTC Dust. **Figure 17** is an SEM micrograph of the vermiculite observed in the WTC Dust.

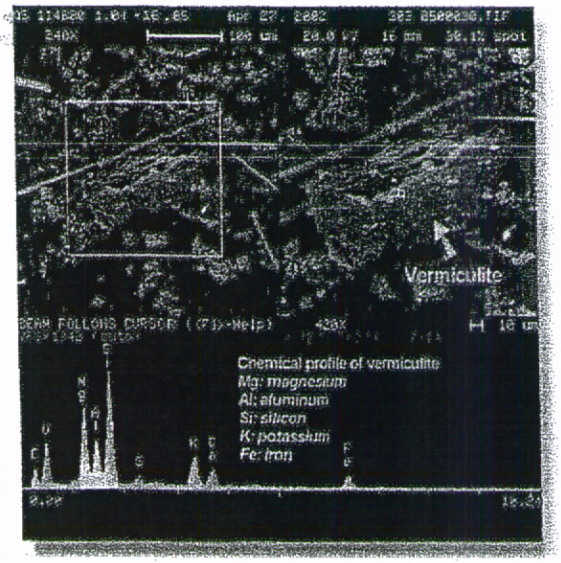


Figure 17. Vermiculte particle in WTC Dust

2.3.5 Heat affected particulate and combustion products

Particles that either were formed as a consequence of high temperature or were modified by exposure to high temperature are important WTC Dust Markers for WTC Dust. Fires that were a part of the WTC Event produced combustion-modified products that traveled with other components of WTC Dust. Considering the high temperatures reached during the destruction of the WTC, the following three types of combustion products would be expected to be present in WTC Dust. These products are:

- Vesicular carbonaceous particles primarily from plastics
- Iron-rich spheres from iron-bearing building components or contents
- High temperature aluminosilicate from building materials

There were considerable amounts of plastics in the WTC buildings, that upon heating and liberation of volatiles produced spherical (or nearly so) carbon-rich particles with vesicles related to emission of volatiles. **Figure 18** shows typical carbonaceous materials from a Background Building and **Figure 19** shows porous heat affected particulate in the WTC Dust. **Figure 20** shows a PLM image of porous heat affected particulate in the WTC Dust.

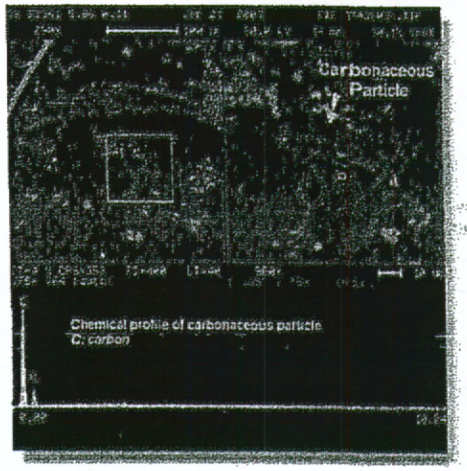


Figure 18. SEM image and EDS of carbonaceous material in Background Building

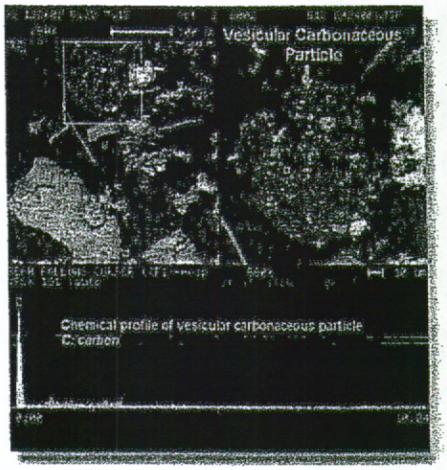


Figure 19. SEM image and EDS of a vesicular carbonaceous particle

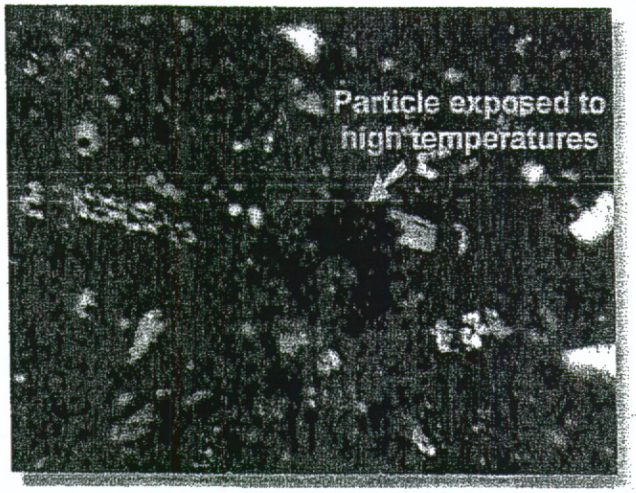


Figure 20. Optical microscopy image of a particle formed by high temperature.

Various metals (most notably iron and lead) were melted during the WTC Event, producing spherical metallic particles. Exposure of phases to high heat results in the formation of spherical particles due to surface tension. **Figure 21** and **Figure 22** show a spherical iron particle resulting from the melting of iron (or steel).

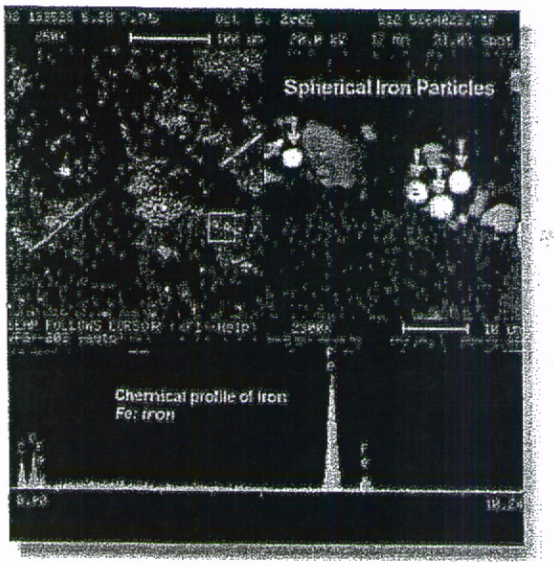


Figure 21. SEM image and EDS of spherical iron particle

Figure 22. Optical microscopy image of a dark particle formed by high temperature.

Silicates (abundant in building materials) can be melted producing spherical or vesicular silicate particles. **Figure 23** and **Figure 24** show the difference between an angular non-porous non-heat affected particle within a Background Building and a porous WTC Dust silicate heat-affected particle.

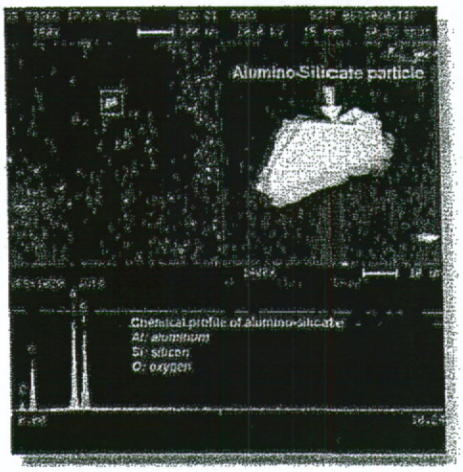


Figure 23. SEM image and EDS of alumino-silicate in Background Building

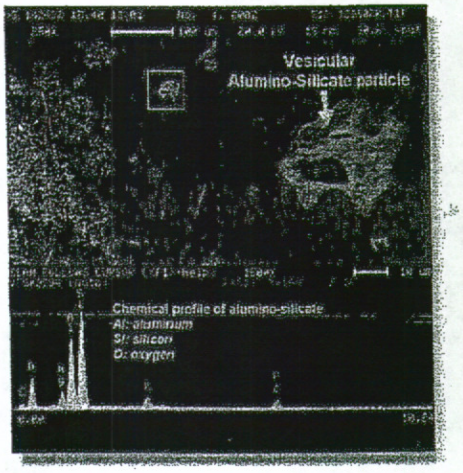


Figure 24. SEM image and EDS of vesicular alumino-silicate

In addition to the spherical iron and aluminosilicate particles, a variety of heavy metal particles including lead, cadmium, vanadium, yttrium, arsenic, bismuth, and barium particles were produced by the pulverizing, melting and/or combustion of the host materials such as solder, computer screens, and paint during the WTC Event.

Combustion-related products are significant WTC Dust Markers, particularly if seen in combination. However, it is worth noting that fly ash and partially combusted products can occur in trace concentrations in ordinary building dusts, but not in the concentrations observed in WTC Dust.

2.4 Other Particle Types

Many other particle types were observed in WTC Dust including cellulose, wood and others. Composite wood products could contain preservatives, retained volatile solvents or free monomers and plastisizers from adhesives or coatings applied to them. These components are indicative of WTC Dust, but also occur in ordinary building products. Thus, in and of themselves, they are not WTC Dust Markers, but are indicative of the WTC Dust.

2.5 Summary

The differences within the WTC Dust and typical background dusts include the fineness and evidence of heat, the size and concentration of the chrysotile, and the length and concentration of the mineral wool and other

fibers, as well as the frequency of occurrence of spherical particles produced by fire and heat, char and soot, and other building products.

3.0 Other WTC Dust Characteristics: Coatings

The amount of energy introduced during the generation of the WTC Dust and the ensuing conflagration caused various components to vaporize. Vapor phase components with high boiling point and high melting point would have, as they cooled, tended to form precipitated particles or thin film deposits on available surfaces through condensation mechanisms. The results of this process would be the presence of a thin layer of deposited material on the surfaces of the dust particulate matter. Many of the materials, such as lead, cadmium, mercury and various organic compounds, vaporized and then condensed during the WTC Event.

A variety of analytical techniques were applied to characterize the surface chemistry of WTC materials. These analytical techniques included scanning electron microscopy/energy-dispersive spectroscopy (SEM/EDS), X-ray microprobe, and X-ray photoelectron spectroscopy (XPS). The SEM and microprobe techniques provided details that sparked interest in a closer look at the surface characteristics. XPS is a surface analysis technique that not only can detect most of the elements of the periodic table, but can also determine their oxidation state or binding energy. Thus XPS can provide chemical species information for elements. XPS is capable of analyzing components in the top 100 angstroms of surface. Because of the sensitivity to surface components, XPS is highly useful in the characterization of chemistry of the surface of the dust particles.

The XPS results indicate the presence of a thin contaminating film or coating associated with the surface of particles. These surface species could be a significant factor affecting the toxicity of the WTC Dust if the coatings on particles and fibers are composed of hazardous substances. The coatings vary in thickness from nanometers (monolayer) to finely dispersed sub-micron particles. The particles and coatings have been detected by low accelerating voltage back-scattered electron imaging, X-ray microprobe analysis, and high resolution XPS. For example, lead peaks from the surface of mineral wool were identified by XPS. The high-resolution, narrow-range XPS scan (**Figure 25**) led to the identification of two lead peaks representing lead oxide or lead sulfate. The presence of lead oxides on the surface of mineral wool indicates the exposure of high temperatures at which lead would have undergone vaporization, oxidation, and condensation on the surface of mineral wool. In addition to the trace amounts of lead, **Table 2** indicates the presence of carbon, nitrogen, oxygen, sodium, silicon, sulfur, chlorine and calcium on the surface of the mineral wool.

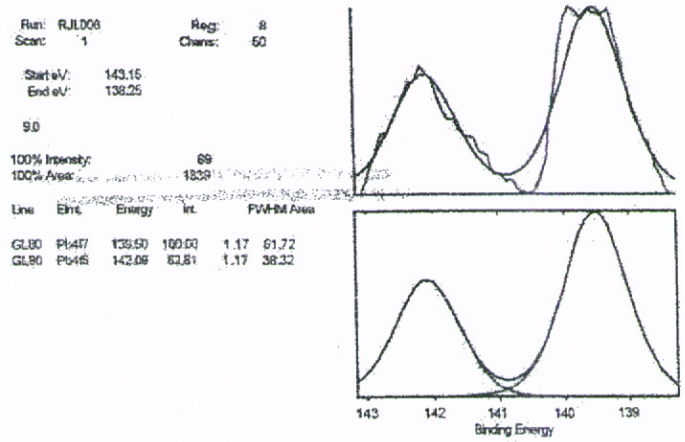


Figure 25. Lead peaks on mineral wool by high resolution XPS. The red trace represents the observed spectrum. The black trace represents the best fit derived from the observed spectrum.

Table 2. Average concentration (atomic percent and weight percent) within 2-4 nm outer Layer of a mineral wool fiber

Element	C	N	O	Na	Si	S	Cl	Ca	Pb
Atom %	67.0	1.25	24.3	0.41	4.65	0.99	0.34	1.22	0.04
Weight %	56.0	1.21	27.0	0.64	9.00	2.17	0.83	3.37	0.52

4.0 Statistical Analysis

Statistical analyses were performed to compare the distribution of particle types within TP-01 occupied spaces of the Building to those found in the Background Buildings by various statistical methods. Background Building samples were analyzed by SEM in the same manner as the samples collected within the *gash* of the Building. The same field technicians, sampling media, equipment, and laboratory technicians were used in all stages to minimize variability.

The data were evaluated using a two-tailed heteroscedastic analysis of means test. This type of test allows for unequal variances in the two populations tested, a condition which often occurs when one population has a substantially higher mean than the other. The statistical analysis was conducted for each of thirteen particle types as well as for composites of Class A and Class C particles. Eleven particle classes were derived from major building products or were influenced by high temperature (Class A particles). An additional two particle types included carbon-rich particles and flakes and carbon-rich fibers such as skin, cellulose, and hair (Class C particles). A summary of the results obtained for this analysis is provided in **Table 3**.

Class A particles are common WTC Dust Markers and Class C particles are common Background Building dust particles. The statistical analysis indicates that the dust in the below ceiling space in the *gash* is different from that observed in Background Buildings. The material collected in the *gash* is consistent with building materials derived from the destruction of the WTC; the carbon-rich particulate is abundant in typical office buildings. The data clearly shows statistically significant differences with the mean values in the two classes of particles, hence the WTC Dust can be distinguished from Background Building dust.

Table 3 Statistical P-values for the comparison of TP-01 dust and dust in Background Buildings.

Class	Particle Type	Mean of Composition (%)	
		Background Buildings	TP-01
A	Mineral Wool	1.05	13.70
A	Glass Fragments	0.52	0.50
A	Glass Fiber	0.23	1.27
A	Perlite	0.26	0.45
A	Vermiculite	0	2.36
A	Ca/Si	0.35	5.11
A	Fe Sphere	0.04	5.87
A	Vesicular Carbonaceous	0.05	1.23
A	Hi Temp Si/Al-rich	0.08	0.54
A	Vermiculite/Gypsum	0	2.72
A	Chrysotile	0	1.84
C	C fiber	5.20	1.02
C	C flake	35.95	1.14
	Class A Combined	2.57	35.58
	Class C Combined	41.15	2.16

The probability of the statistical evaluation of the above data demonstrates that the WTC Dust and background dust have different sources.

5.0 Addenda

5.1 Sampling Design and Statistical Analysis

A detailed discussion of sampling design and statistical analysis is presented in the Insurance Claim Report dated May 2003, Volume III: Statistical Analysis.

Sampling for contaminants of concern was performed in stages for each sampling protocol. Statistical analyses of the data were performed on data sets as they became available throughout sampling activities. The work scope and extent of field sampling activities and laboratory analyses to be executed were decided based upon information provided by the on-going statistical evaluation of analytical results.

This was essentially an iterative process. As data were reviewed, the number, type and location of additional samples were projected. The number of samples obtained was evaluated to determine if there were statistically significant differences between the mean values of building segments. This was performed using a predetermined level of precision (e.g., 95% confidence interval) for specified subdivisions of the Building.

Initial Building-wide evaluation of the contaminant data demonstrated that the contaminant concentrations are well approximated by a log normal distribution. Therefore, statistical evaluations were performed on log-transformed data sets using the following approach:

- Initial sampling was performed at random locations within predetermined grid locations of the Building.
- A statistical analysis (e.g., average, standard deviation) of the analytical results for each analyte was performed.
- The standard errors of the average values were estimated based upon the standard deviations and number of samples analyzed.
- Using the central limit theorem, the total number of samples (and number of additional samples) required ensuring the desired level of precision with 95% confidence was calculated.

5.2 Sampling

Samples were collected from the Building using "TP-01: Protocol for the Monitoring of Non-Biological Indoor Environmental Contaminants" dated May 10, 2002. Two kits, each containing media for eight samples, were taken to each predetermined grid location for below-ceiling and above-ceiling sampling. Each kit contained:

- Asbestos Wipe
- Silica Microvac
- Metals Wipe
- Mercury Wipe
- Dust Lift
- PNAs Wipe
- PCBs Wipe
- Dioxins/Furans Wipe

The test protocol sets forth the complete methodology in Volume III: Protocols.

5.3 Sample Location Selection

Upon arrival in the predetermined grid location, a below-ceiling undisturbed area was selected. The sampling areas included, for example, file cabinets, tables or credenzas. In the same vicinity of the below-ceiling sample, an above-ceiling sampling area was selected. These areas were often the tops of drop ceiling lights (**Figure 26**).

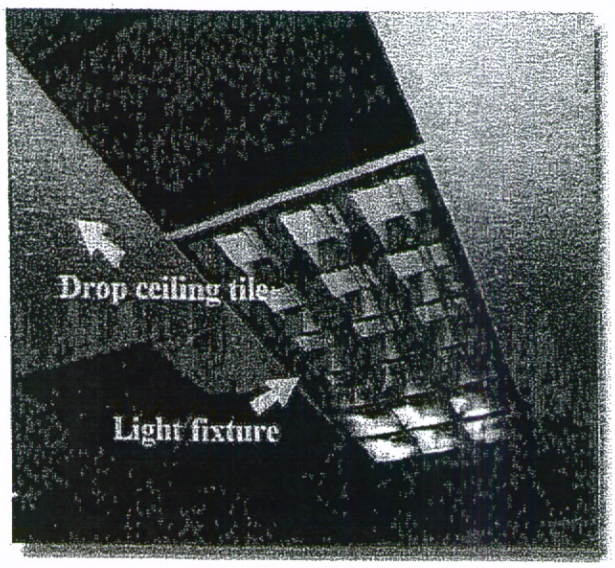


Figure 26. Typical drop ceiling light used for above-ceiling samples

Most above-ceiling and below-ceiling samples were taken from horizontal surfaces; however, a suitable horizontal surface from which to sample was not always available, in which case samples were taken from vertical surfaces.

5.4 Sampling Procedures

In order to sample a finite area, a disposable template (usually 100 cm^2) was utilized (**Figure 27**). The actual area sampled was documented for each wipe and microvac sample collected.

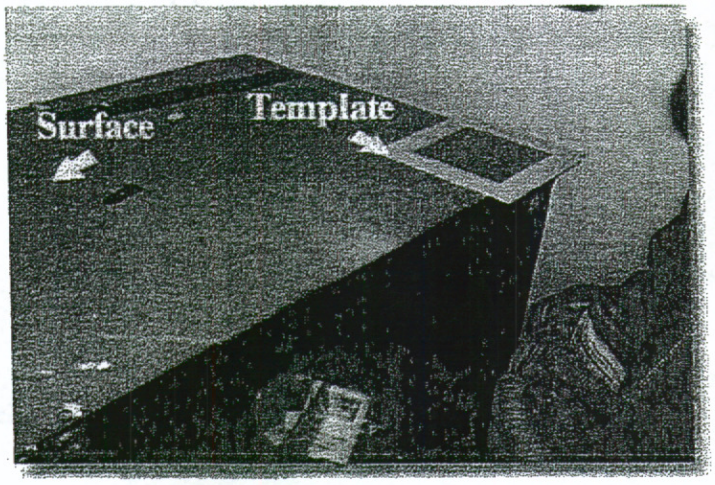


Figure 27. Below-ceiling sampling surface and template

Samples collected throughout the Building were documented using a Personal Data Assistant (PDA). Each sample was given a unique identification number using adhesive bar code labels that were affixed to the sample container. Information regarding the sample including location, area sampled, component sampled, matrix, and visual observations of the area were recorded. Additionally, each sample location was photographed and documented on a grid map.

Three types of sampling media were used (wipe, microvac, and lift), as described below.

5.5 Lift Samples

Dust characterization samples were collected using adhesive "lift" samples. A lift sample is a plastic strip with an adhesive coating on one side as shown in **Figure 28**.

Figure 28. Lift sampling media

The lift was placed on the surface to be sampled, adhesive side down. Using finger pressure, the lift was pressed onto the surface, allowing dust to adhere to the lift (**Figure 29**). The lift was placed in a plastic box that was then put into a plastic bag.

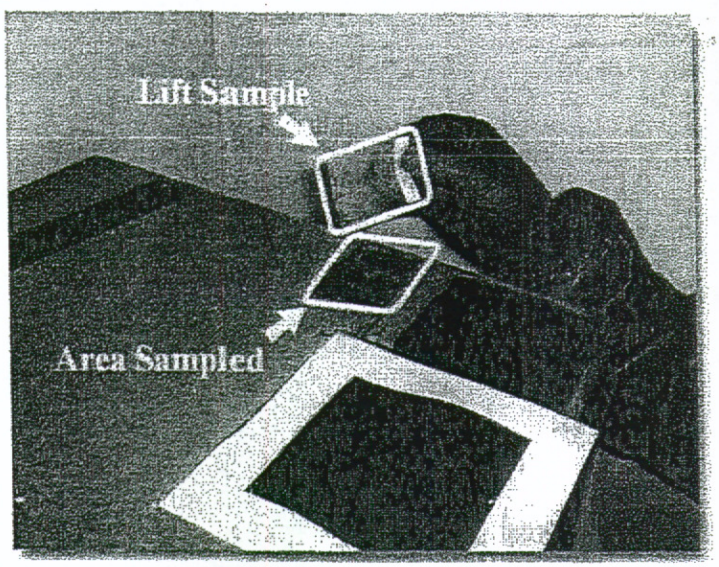


Figure 29. Dust adhered to lift sampling media

5.6 Sample Analysis

Samples were analyzed using industry standard analytical laboratory methods as follows.

- Microvac samples were analyzed for asbestos using transmission electron microscopy (TEM) in accordance with ASTM 5755.
- Samples were analyzed for metals in accordance with NIOSH 7300 method, using inductively coupled argon plasma (ICP) spectrometry.
- Samples were analyzed for mercury in accordance with EPA Method SW846 7471A, using cold vapor atomic absorption (CVAA).
- Samples were analyzed for PCBs in accordance with EPA Method SW 846 8082 using gas chromatography with electron capture detectors (GC/ECD).
- Samples were analyzed for PNAs in accordance with EPA Method SW 846 8270C using gas chromatography with mass spectrometry (GC/MS).
- Samples were analyzed for dioxins/furans in accordance with EPA Method SW 846 8290 using gas chromatography with high-resolution mass spectrometry (GC/HRMS).

- Samples were analyzed for dust, particle characteristics, and WTC Signature using scanning electron microscopy (SEM), coupled with energy dispersive spectroscopy (EDS) techniques.
- Samples were analyzed for silica using X-ray Diffraction (XRD) in accordance with NIOSH 7500 and NIOSH 0600 methods.

Evaluation of Sealed Police Uniform Articles for World Trade Center Dust Constituents

Project Number: RLH108271

December 2011

Prepared for:

Officer Alonzo Harris

RJ LEE GROUP

DELIVERING SCIENTIFIC RESOLUTION

Table of Contents

List of Tables

1.0 Overview

On Tuesday, August 16, 2011, Officer Alonzo Harris of the NYPD visited RJ Lee Group to discuss his 911 experience and to deliver a uniform for evaluation. Harris was a first responder at the WTC event on September 11, 2001. When the towers collapsed, Harris was less than a block from the perimeter of Tower 2. Harris was injured and covered with dust as a result of the shock wave and building collapse associated with the disaster. Shortly after being injured, he sought medical attention and was then sent home. Reportedly, Harris sealed his clothing in plastic bags on Sept. 11, 2011 and has not handled the items since that day.

The purpose of inspecting the uniform was to determine if there was evidence of WTC dust present. WTC dusts have been determined to contain a variety of constituents and chemicals of concern including finely pulverized cement dust, asbestos, mineral wool, gypsum and crystalline silica as well as heavy metals and semi-volatile organic compounds. Subsamples were obtained from the garments and the portions were submitted for laboratory analysis using a variety of different analytical methods. The dust on the uniform contained chemicals and particulates that were consistent with WTC dusts that were reported previously from the evaluation of dusts in buildings by RJ Lee Group (ref. WTC Dust Signature Report Summary – December 2003).

2.0 Visual Inspection and Sampling

The clothing articles were submitted to RJ Lee Group in a plastic container that was sealed with packing tape. A letter of transmittal accompanied the container stating the items were sealed on September 11, 2001. A copy of the executed letter of transmittal is included in Appendix A.

Pictures of the uniform were obtained during the visual inspection and sampling of the uniform, which was performed on August 18, 2011. Representative pictures of the articles that were sampled are included in Appendix B.

The contents of the container included official NYPD issue pants and shirt. A light blue t-shirt was also included in the bags. The uniform pants and shirt were both sampled during the visual inspection. The

uniform garments were non-uniformly covered with a heavy loading of fine gray dust. During the examination, six 10 cm x 10 cm swatches from each uniform piece were obtained and sealed in glass jars for laboratory analysis. In addition, 1 cm diameter SEM sampling stubs and 2" x 3" adhesive lift samples were also obtained for laboratory analysis.

Following the visual inspection and sampling of the uniform, the remaining portions of garments were sealed in large plastic bags and archived.

3.0 Laboratory Analyses

Samples obtained from the uniform pants and shirt were prepared and analyzed using standard analytical laboratory methods as follows:

Asbestos

One swatch from the pants and one swatch from the shirt samples were analyzed for asbestos fibers using Transmission Electron Microscopy (TEM) using ASTM method D6480. Asbestos concentrations were reported based on the amount of structures detected per unit area of the fabric swatch sample obtained. The laboratory report issued for the TEM analyses of the samples is presented in Appendix C.

Crystalline Silica

A fabric swatch from the pants and shirt were individually prepared by subjecting the material(s) to ultra-sonication in water using the ASTM method D6480 sample preparation method as a guideline. The suspensions containing the liberated particles were vacuum filtered onto pre-weighed 5.0 µm pore size, 47mm diameter PVC filters. The filters were dried, desiccated and then post-weighed to obtain the total amount of non-water soluble dusts.

The filters were then ashed using an oxygen plasma asher. An aliquot of the ashed material was then deposited onto a silver membrane filter using vacuum filtering techniques. The prepared silver membrane filter was then analyzed using x-ray diffraction techniques following the NIOSH 7500 methodology. Results should be reported as a weight percent crystalline silica and total micrograms per swatch basis. The laboratory report for the crystalline silica analyses is presented in Appendix D.

Metals

Fabric swatch samples from the shirt and pants were extracted for acid soluble metals using EPA Method SW846 3050B. The extracts were then analyzed using Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) techniques following the EPA SW846 method for the following elements:

Antimony (Sb)	Arsenic (As)	Barium (Ba)
Beryllium (Be)	Cadmium (Cd)	Chromium (Cr)
Copper (Cu)	Lead (Pb)	Manganese (Mn)
Mercury (salts/particulate – Hg)	Nickel (Ni)	Zinc (Zn)

The laboratory report for the metals analyses that were conducted are presented in Appendix E.

Dust Characterization - Microscopy

The adhesive stub samples containing particulates that were liberated from the surfaces of the uniform were analyzed using Scanning Electron Microscopy (SEM) to classify the particles based on elemental composition and particle morphology. The adhesive lift samples were analyzed using reflected light microscopy and polarized/transmitted light microscopy. The results from the microscopy analyses are shown in Appendix F.

Polychlorinated biphenyls (PCBs)

Solvent extracts from fabric swatch samples from the uniform pants and shirt were analyzed for common PCB aroclors following EPA Method SW846 8082 using gas chromatography with electron capture detection (GC/ECD). Results are reported on a total microgram per sample basis by aroclor classification and the laboratory report is presented in Appendix G.

Polynuclear Aromatic Hydrocarbons (PNAs)

Solvent extracts from fabric swatch samples from the uniform pants and shirt were analyzed for 16 different PNA compounds following EPA method SW846 8270 (mod.) using a gas chromatograph with mass spectrometric detection (GC/MS). Results are reported for each compound on a total micrograph per sample basis and are presented in Appendix H. A weighted total amount of PNAs was then determined for each sample using the EPA 1993 relative potency factors to weight the results based on estimated toxicity.

Polychlorinated Dibenzo-dioxins/furans (PCDDs/PCDFs)

Extracts from fabric swatch samples were analyzed using High Res. HRGC/HRMS methods (EPA SW846 8290). Results were reported on a total picogram per sample basis by compound and using the World Health Organization Toxicity Equivalency Factors (TEFs). The TEFs were used to calculate effective TEQ concentration(s). The laboratory report from the PCDDs/PCDFs analyses are presented in Appendix I.

4.0 Results and Discussion

The laboratory results from the analyses of the dusts/particulates and fabric swatch specimens excised from the uniform pants and shirt were compared to evaluate if the substances had the same characteristics as WTC dusts. A comparison was made based on the WTC Dust Signature requirements that were established by RJ Lee Group in 2003. The WTC Dust Signature characteristics are based on evaluation of multiple samples using a variety of laboratory analysis methods to characterize the particle populations and chemical constituents of a dust sample. Select criteria from the evaluation of the results must be met in order for the material to be classified as WTC Dust.

Table 1. WTC Dust Evaluation Criteria for Laboratory Results

Analysis Type	WTC Dust - Minimum Criteria
Dust Characterization by SEM	mineral wool and gypsum present + one of the following: spherical iron, vesicular carbonaceous particle, hi-temp alumino-silicate, chrysotile asbestos
Asbestos by TEM	chrysotile asbestos present
Mercury/Lead by ICP	Either Lead or Mercury must be detected
Heavy Metals by ICP	Four of the following must be present: barium, chromium, manganese, zinc, beryllium, copper, cadmium, nickel
Semi-volatile Organics	One or more of the following present: PCBs, PNAs, Dioxins/Furans
Summary	**All five minimum criteria must be positive for the Samples to be considered consistent for WTC Dust.**

Using the criteria in Table I for determination of the WTC Dust classification, laboratory results from both samples are summarized in Table 2 below.

Table 2. Comparison of Laboratory Results to WTC Dust Classification Criteria.

Analysis Type	Results from Pants	Results from Shirt
Dust Characterization by SEM (min. 100 random particles)	26 particles – Mineral Wool 29 particles – Gypsum (Ca/S-rich) 1 particle – High Temp Al/Si-rich 5 particles – Chrysotile	17 particles – Mineral Wool 30 particles – Gypsum (Ca/S-rich) 4 particles – Chrysotile
Asbestos by TEM	59,000 Structures/cm^2 (Chrysotile)	5,900 Structures/cm^2 (Chrysotile)
Mercury/Lead by ICP	Lead: 279 µg/ft^2	Lead: 93 µg/ft^2
Heavy Metals by ICP	Barium: 432 µg/ft^2 Chromium: 347 µg/ft^2 Manganese: 853 µg/ft^2 Zinc: 2,770 µg/ft^2 Copper: 929 µg/ft^2 Cadmium: 14 µg/ft^2 Nickel: 277 µg/ft^2	Barium: 119 µg/ft^2 Chromium: 3,160 µg/ft^2 Manganese: 2,630 µg/ft^2 Zinc: 1,640 µg/ft^2 Copper: 369 µg/ft^2 Cadmium: < 9 µg/ft^2 Nickel: 178 µg/ft^2
Semi-volatile Organics	PCBs: 1.2 µg/ft^2 (pcb - aroclor 1260) PNAs: 32 µg/ft^2 (EPA BAP Equiv. Basis) Dioxins/Furans: 70 pg/ft^2 (WHO TEQ Basis)	PCBs: 1.1 µg/ft^2 (pcb - aroclor 1260) PNAs: non-detect (EPA BAP Equiv. Basis) Dioxins/Furans: 49 pg/ft^2 (WHO TEQ Basis)
Summary	***Positive for WTC Dust***	***Positive for WTC Dust***

Based on the criteria provided, both the dust on the shirt and pants of the uniform is consistent with WTC Dust.

5.0 Summary

On August 16th, 2011, articles of clothing from a police uniform were submitted for evaluation. The clothing articles were worn by Officer Harris on September 11, 2001 during the time when he was a first responder to the event. The clothing was reported to be sealed on September 11, 2001 by Officer Harris after he had sought medical treatment. The clothing articles were removed from the packaging on August 18, 2011. It was noted during a visual inspection of the garments that they were non-uniformly covered with a fine gray dust. Swatch specimens were excised from various regions of the uniform pants and shirt for laboratory analysis. In addition, dusts and particulates were sampled using forensic particulate sampling methods.

The uniform swatches and particulate specimens isolated from the clothing were analyzed using a variety of laboratory analysis techniques. The purpose of the laboratory analyses was to determine if the chemicals and particles of potential concern documented in WTC dusts were present on the garments. Based on the analyses of the samples, Officer Harris was exposed to highly alkaline cement dust, finely divided mineral wool, gypsum, and chrysotile asbestos as well as heavy metals, dioxins and PCB/s. Based on the presence of the combination of these substances, we conclude the dust on the clothing was consistent with WTC Dust. Exposure to these many of these substances at elevated concentrations has been correlated with significant adverse health effects and disease.

Appendix A
Chain-of-Custody Letter

LETTER OF TRANSMITTAL OF PROPERTY

August 15, 2011

From: Alonzo Harris
2400 Hunter Avenue # 24C
Bronx, N.Y. 10475

To: R.J. Lee Group Inc.
350 Hochberg Road
Monroevilloe PA 15146- 1516

Dear ; Dr. Richard Lee

I, Police Officer Alonzo Harris , Shield # 12978 Of The New York City Police Department, am a First Responder from the event of September 11, 2001.

I was driving in Police car #9251 at the time of 8:40 a.m on September 11, 2001 . I. was on Broadway and Murray Streets when the first plane hit Tower #2. I rushed to help people who were fleeing from Church St . After an hour and a half of doing so I had to be transported to Bellevue Hospital. After being tested by the World Trade Center Medical Monitoring and Treatment Program, I had been evaluated with Asthma and RADS as well as Upper Air Way Disease.

I have my uniform which for 9 years has not been cleaned or altered in any way and has been sealed in a plastic bag and kept in a covered box since September 11, 2001 .

I am giving a portion of my uniform to your organization ,The R.J.L. Lee Group Inc, for Medical Testing and Scientific Studies of the Environmental Factor , to research what was in the air on September 11, 2001. I am giving it to you on behalf of The First Responders on a Probono basis.

I would like you to provide me with written documentation as to your findings. Please sign below indicating your approval and compliance to this acknowledgement and acceptance.

Richard J Lee — Aug 16, 2011, 11:30 AM

Authorized Signatory
RJ Lee Group Inc.

Appendix B
Photographs of Sampling of Garments

Figure 1. Photograph of the opening of the container containing a uniform that was reported to be sealed on September, 11, 2001.

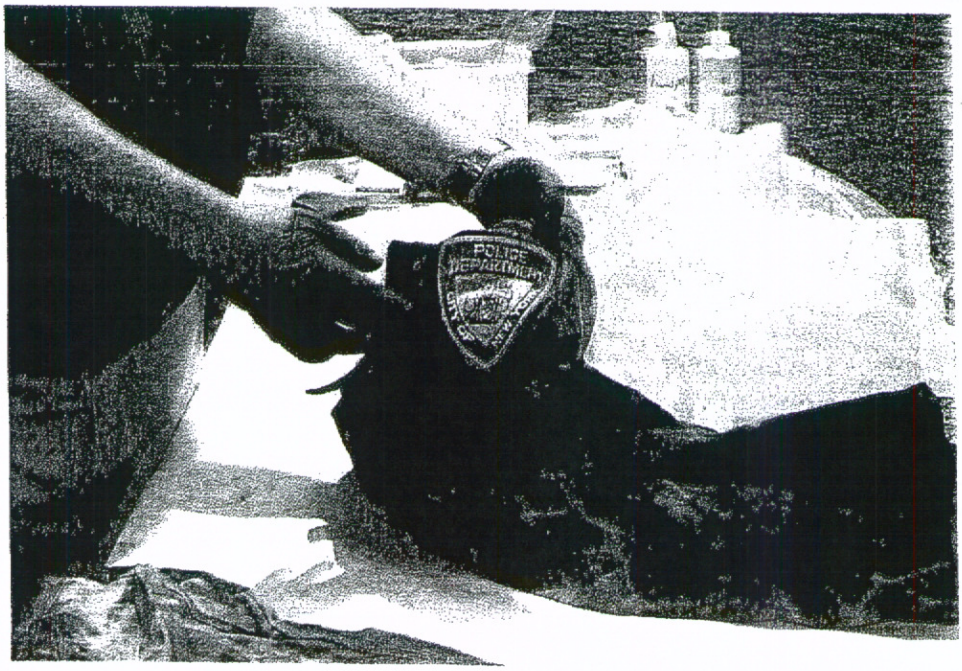


Figure 2. Photograph of uniform shirt illustrating the variable distribution of dust on the clothing.

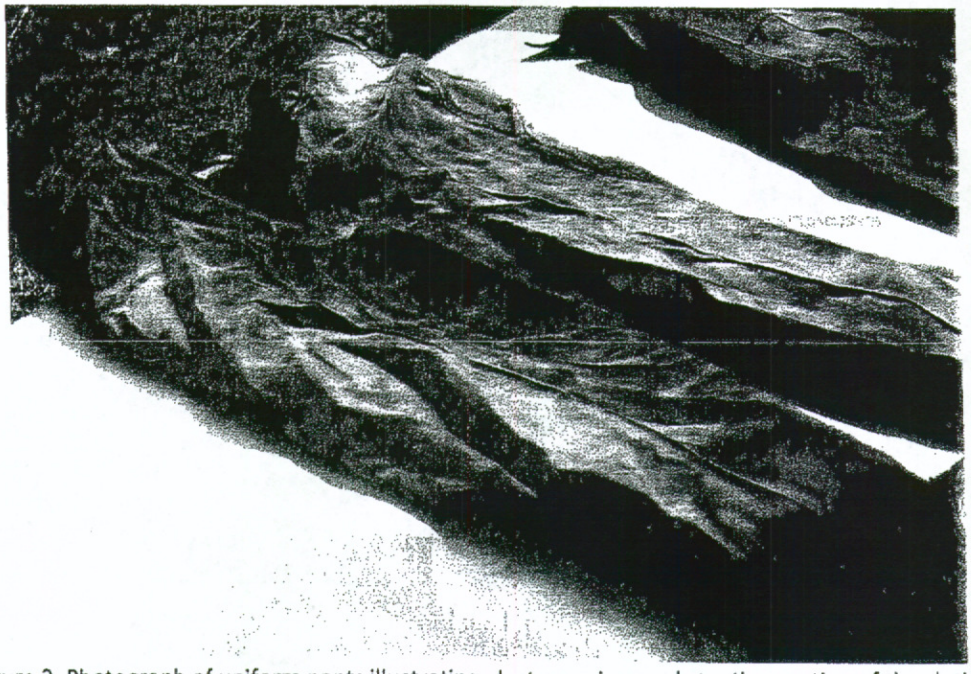


Figure 3. Photograph of uniform pants illustrating dust covering a substantive portion of the clothing.

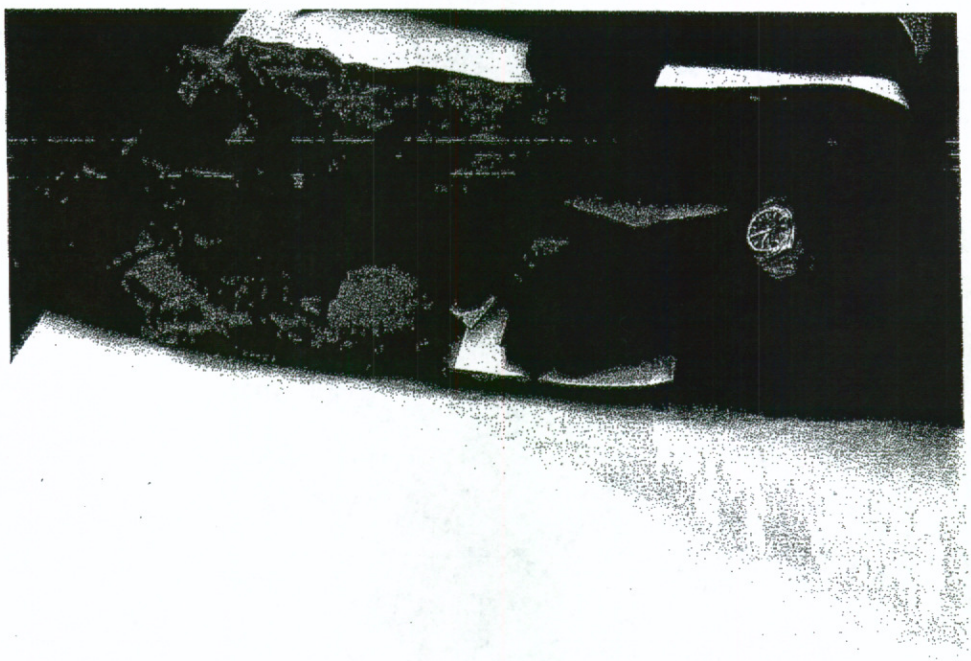


Figure 4. Photograph illustrating the removal of 10 cm x 10 cm swatches from the uniform pants to obtain swatches suitable for laboratory analyses can be performed.

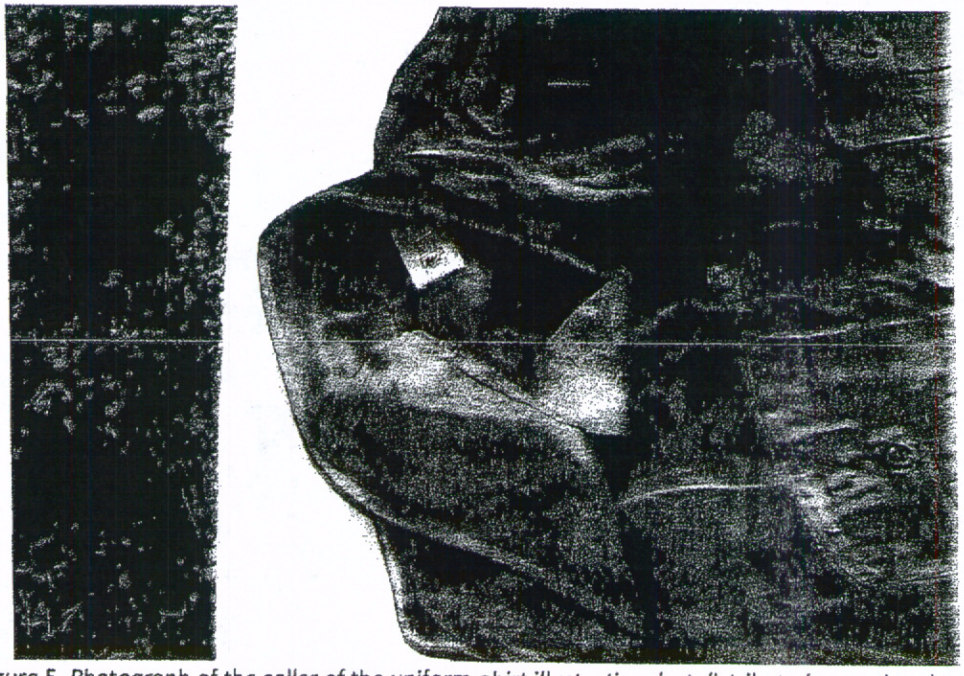


Figure 5. Photograph of the collar of the uniform shirt illustrating dust distributed around neck area.

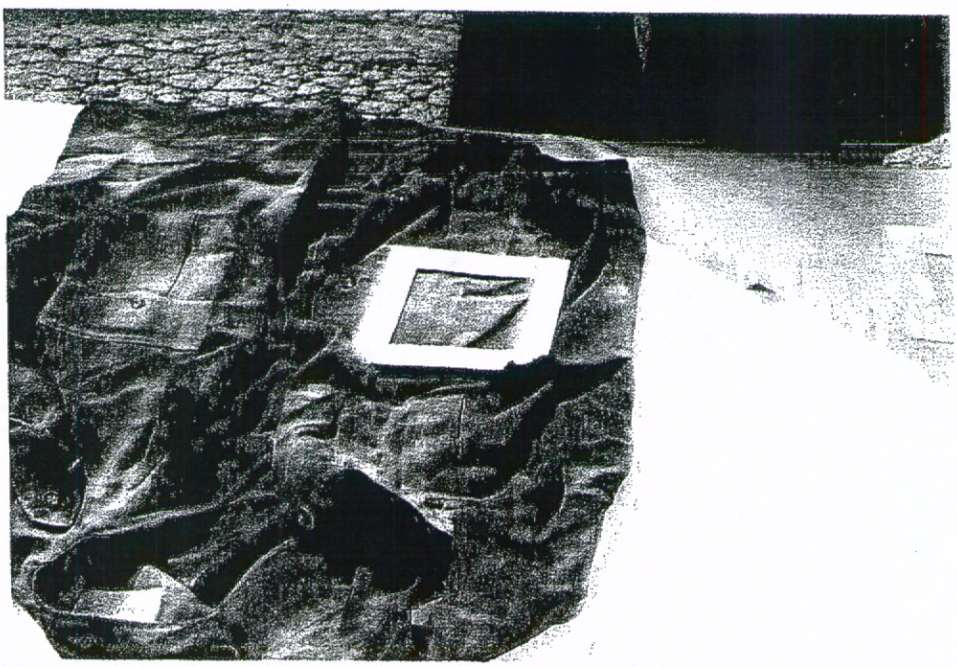


Figure 6. Photograph of uniform shirt along with template used to obtain swatch samples for laboratory analyses.

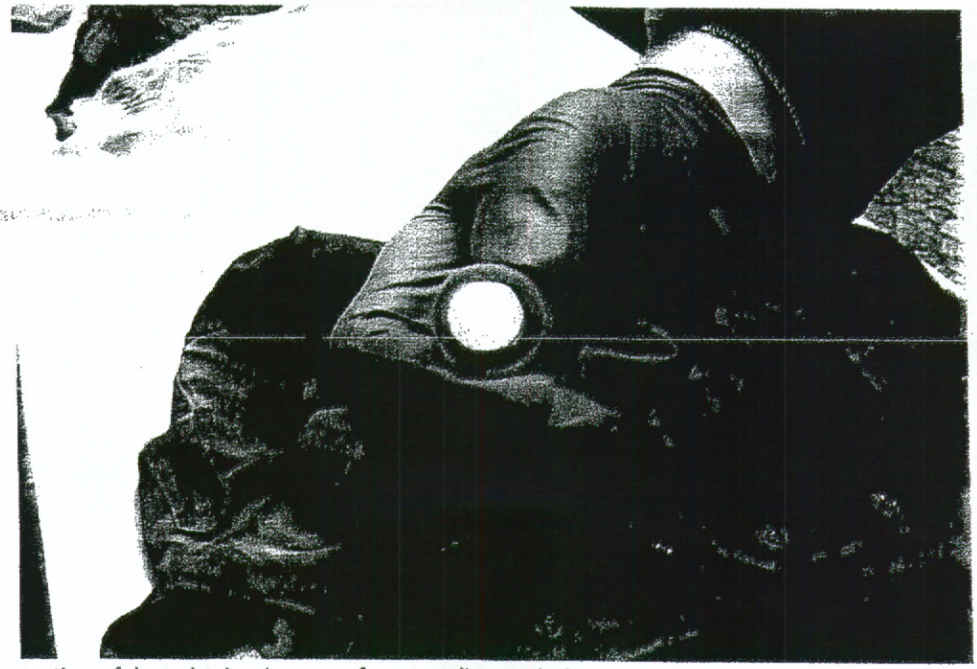


Figure 7. Illustration of dust obtained on a surface sampling stub that was used to liberate particles from the surface of the uniform for laboratory analysis.

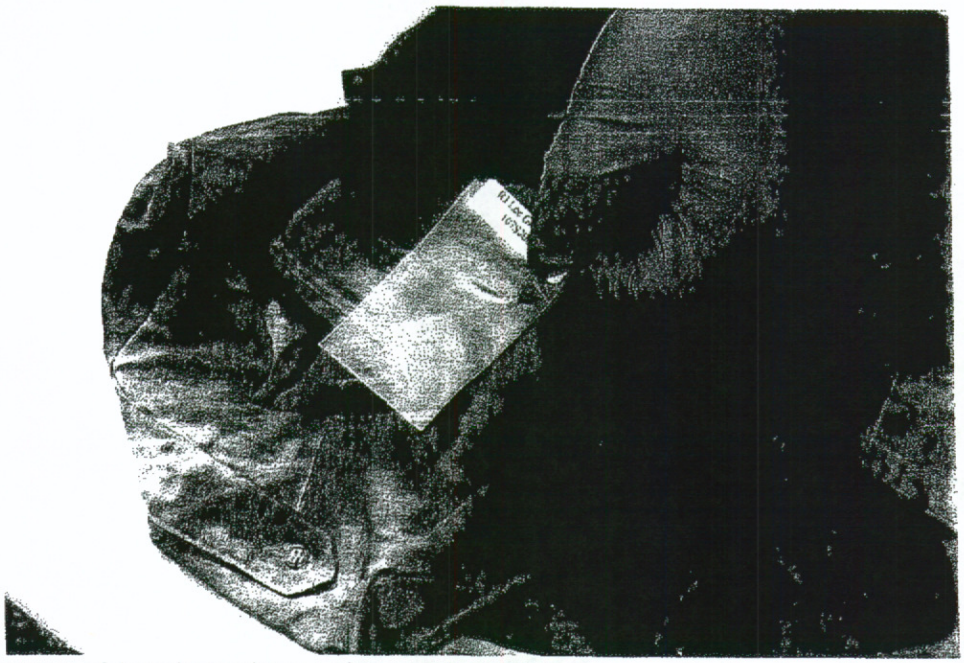


Figure 8. Illustration of dust obtained on a surface sampling strip that was used to liberate particles from the surface of the uniform for laboratory analysis.

Appendix C
TEM Results

RJ Lee Group, Inc.
350 Hochberg Road, Monroeville, PA 15146
Tel: (724) 325-1776 | Fax: (724) 733-1799

Final Laboratory Report

TEM Dust Protocol

Mr. Keith Rickabaugh
RJ Lee Group, Inc.
350 Hochberg Road
Monroeville, PA 15146-1516
US

Report Date: 8/29/2011
Sample Receipt Date: 8/22/2011
RJ Lee Group Job No.: RLH108271-3
Authorization/P.O. No.:
Samples Received: 2
Client Job No./Name: Officer Harris 1st Responder

Method: ASTM D 6480-99 Standard Test Method

Client Sample Number	RJLG Sample Number	Area Sampled (cm^2)	Area Analyzed (mm^2) Total	Area Analyzed (mm^2) ≥5µm	Effective Filter Area (mm^2)	Dilution Factor	Total Asbestos Structures Chry	Total Asbestos Structures Amph	Asbestos Structures ≥5µm Chry	Asbestos Structures ≥5µm Amph	Concentration Analytical Sensitivity S/cm^2 Total	Concentration Analytical Sensitivity S/cm^2 ≥5µm
5	3078520.HTA2	100	0.0919	0.0919	385	.01	14	0	2	0	5.9E 4	8.4E 3
											4.2E 3	4.2E 3
13	3078528.HTA2	100	0.0919	0.0919	385	.1	14	0	2	0	5.9E 3	8.4E 2
											4.2E 2	4.2E 2

Authorized Signature: Matt Sanchez
Matt Sanchez, Manager Analytical Services

Notes:
1. Area sample provided by RJ Lee Group, Inc..
2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
3. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NVLAP #101208-0, NY ELAP #10844) facility.
4. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, S-Structures.
6. Samples will be held for 90 days and then disposed of per Federal regulations.
7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

Caution must be applied when interpreting the results of samples prepared using indirect sample preparation techniques. Studies have shown that indirect preparation techniques may result in substantial increases in the fiber count when compared to fiber counts which would have been obtained using direct sample preparation.

RJ Lee Group, Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for select test methods for airborne asbestos analysis (TEM), asbestos fiber analysis (PLM), New York Department of HEALTH Environmental Laboratory Program (ELAP), and by the American Industrial Hygiene Association (AIHA). This test report relates only to the items tested. This report may not be used to claim product endorsement by NVLAP, any agency of the US Government, or any other laboratory accrediting agency. Any reproduction of this document must be in full in order for the report to be valid. This report is not valid unless it bears the name of a NVLAP-approved signatory.

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limiting provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of ninety (90) days before discarding. A shipping and handling fee will be assessed for the return of any sample.

ASTM 6480

RJ Lee Group, Inc.
TEM Count Sheet

Date Analyzed: 8/25/2011

RJL: RLH108271-3	3078520.HTA2	Microscope tem2000fx1	Grid Openings	10
5	RJ Lee Group, Inc.	Magnification 21 KX	Asbestos	14.0
Area: 100 cm²	Grid: 0.0092 mm²	Acc. Voltage 120 KV	Asbestos >= 5µm	2.0
Dil: .01	Filter Size: 25 mm	Operator: Lori Huss		
HQ37359		Cv = 1.24		

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2	1	1.5	0.15	Chrysotile	B	MgSi	5536B	Image1	Diff1		
2	2	1.25	0.12	Chrysotile	B	MgSi	5537B	Image2	Diff2		
3	1	2.5	0.05	Chrysotile	F	MgSi	5538B	Image3	Diff3		
3	2	1.35	0.1	Chrysotile	B	MgSi	5539B	Image4	Diff4		
4	1	2.35	0.07	Chrysotile	F	MgSi	5541B	Image5	Diff5		
5	1	37	0.08	Chrysotile	B	MgSi					
6				NSD							
7	1	2.5	0.05	Chrysotile	F	MgSi			X		
8	1	1.5	0.2	Chrysotile	B	MgSi			X		
9	1	1	0.05	Chrysotile	F	MgSi		Image6	Diff6		
9	2	26	0.05	Chrysotile	F	MgSi			X		
9	3	1	0.05	Chrysotile	F	MgSi			X		
9	4	3.75	0.05	Chrysotile	F	MgSi			X		
10	1	1	0.05	Chrysotile	F	MgSi			X		
10	2	1.5	0.05	Chrysotile	F	MgSi			X		

3% Particulate

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/25/2011 10:55:13 PM approve by Bob Graham
Final Review: 8/29/11 9:48 AM approve by Matt Sanchez

ASTM 6480

RJ Lee Group, Inc.
TEM Count Sheet

Date Analyzed: 8/27/2011

RJL: RLH108271-3	3078528.HTA2	Microscope tem2000fx1	Grid Openings	10
13	RJ Lee Group, Inc.	Magnification 21 KX	Asbestos	14.0
Area: 100 cm²	Grid: 0.0092 mm²	Acc. Voltage 120 KV	Asbestos >= 5µm	2.0
Dil: .1	Filter Size: 25 mm	Operator: Bob Graham		
HQ37359		Cv = 2.04		

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2	1	1	0.15	Chrysotile	B	MgSi	5552B	Image2	Diff2		
3				NSD							
4	1	1	0.15	Chrysotile	B	MgSi	5553B	Image4	Diff4		
4	2	1	0.2	Chrysotile	B	MgSi	5554B	Image5	Diff5		
5				NSD							
6	1	1.6	0.05	Chrysotile	F	MgSi		Image6	Diff6		
6	2	0.75	0.15	Chrysotile	B	MgSi		Image7	Diff7		
6	3	2.25	0.06	Chrysotile	F	MgSi					
7	1	1.25	0.05	Chrysotile	F	MgSi					
7	2	1.5	0.06	Chrysotile	F	MgSi					
7	3	3.5	0.15	Chrysotile	B	MgSi	5555B	Image8	Diff8		
8	1	5.15	0.1	Chrysotile	B	MgSi					
8	2	3.5	0.04	Chrysotile	F	MgSi					
8	3	1	0.05	Chrysotile	C	MgSi					
8	4	0.8	0.04	Chrysotile	F	MgSi					
9	1	5	0.06	Chrysotile	F	MgSi					
10				NSD							

6% Particulate

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/27/2011 6:36:12 PM approve by Bob Graham
Final Review: 8/29/11 9:48 AM approve by Matt Sanchez

Appendix D
Silica Results

RJ LEE GROUP

RJ Lee Group, Inc.
350 Hochberg Road, Monroeville, PA 15146
Tel: (724) 325-1776 | Fax: (724) 733-1799

LABORATORY REPORT

RJ Lee Group, Inc.
350 Hochberg Road
Monroeville, PA 15146-1516
ATTENTION: Keith Rickabaugh
TELEPHONE: 724 - 325 - 1776

REPORT DATE	September 7, 2011
SAMPLES RECEIVED	August 16, 2011
RJ LEE GROUP JOB NO.	RLH108271
CLIENT JOB NO.	Officer Harris 1st Responder
PURCHASE ORDER NO:	N/A

ANALYSIS: Crystalline Free Silica Dust
METHODS: X-Ray Diffraction, Modified NIOSH 7500

Limits of Detection: 0.005 mg Quartz , Cristobalite, and Tridymite

Sample Identification		Respirable** Dust Mass	Masses of Free Silica Minerals (mg/100cm²)			Weight Percentages of Crystalline Silica Minerals		
Client I.D.	RJ Lee Group	(mg)	Quartz	Cristobalite	Tridymite	Quartz	Cristobalite	Tridymite
6 **	3078521	88.383	3.784	< 0.200	< 0.200	4.3	< 0.2	< 0.2
6 Dup. **	3078521	88.383	2.214	< 0.200	< 0.200	2.5	< 0.2	< 0.2
14 **	3078529	78.885	1.976	< 0.200	< 0.200	2.5	< 0.3	< 0.3
14 Dup. **	3078529	78.885	2.237	< 0.200	< 0.200	2.8	< 0.3	< 0.3
Blank	3078578	< 0.100	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A

* Supplied by the client.

** Deposit weight exceeded recommended limit for NIOSH 7500. Samples were ground and then prepared by taking an aliquot from the 2-propanol suspension.

N/A Not Applicable

Appendix E
ICP Results

RJ LeeGroup, Inc.
350 Hochberg Road, Monroeville, PA 15146
Tel: (724) 325-1776 | Fax: (724) 733-1799

LABORATORY REPORT

Report amended 12/07/2011 to include sampling date.

RJ Lee Group, Inc.
350 Hochberg Road
Monroeville, PA 15146

Attn: Kristy Anderson
Phone: 724-325-1776

Email: kanderson@rjlg.com

RJ Lee Group Job No.: RLH108271 Rev. 01
RJ Lee Group Chemistry Job No.: IN23082011P010
Samples Received: August 23, 2011
Report Date: August 26, 2011
Client Project: N/A
Purchase Order No.: N/A
Matrix: Wipe
Prep/Analysis: EPA 3050B / EPA 6010C (Wipes)-PA

Client Sample ID	RJ Lee Group ID	Sampling Date	Analyte	Wipe Area (100 cm²)	Sample Concentration		Minimum Reporting Limit		Analysis Date	Q
					Total µg	µg/100 cm²	Total µg	µg/100 cm²		
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Antimony	100	263	263	5.00	5.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Arsenic	100	< 5.00	< 5.00	5.00	5.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Barium	100	46.5	46.5	2.00	2.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Beryllium	100	< 0.800	< 0.800	0.800	0.800	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Cadmium	100	1.55	1.55	1.00	1.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Chromium	100	37.4	37.4	2.00	2.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Copper	100	100	100	3.00	3.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Lead	100	30.3	30.3	5.00	5.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Manganese	100	91.8	91.8	2.00	2.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Mercury	100	< 10.0	< 10.0	10.0	10.0	08/24/2011	S
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Nickel	100	29.8	29.8	1.00	1.00	08/24/2011	
Pant 4 leg left-front upper thigh	3078519	08/18/2011	Zinc	100	298	298	5.00	5.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Antimony	100	312	312	5.00	5.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Arsenic	100	< 5.00	< 5.00	5.00	5.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Barium	100	12.8	12.8	2.00	2.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Beryllium	100	< 0.800	< 0.800	0.800	0.800	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Cadmium	100	< 1.00	< 1.00	1.00	1.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Chromium	100	340	340	2.00	2.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Copper	100	39.7	39.7	3.00	3.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Lead	100	9.96	9.96	5.00	5.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Manganese	100	283	283	2.00	2.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Mercury	100	< 10.0	< 10.0	10.0	10.0	08/24/2011	S
Shirt 12 front left above pocket	3078527	08/18/2011	Nickel	100	19.2	19.2	1.00	1.00	08/24/2011	
Shirt 12 front left above pocket	3078527	08/18/2011	Zinc	100	176	176	5.00	5.00	08/24/2011	

Philip Grindle
Philip Grindle
Laboratory Supervisor

RJ LeeGroup, Inc.
350 Hochberg Road, Monroeville, PA 15146
Tel: (724) 325-1776 | Fax: (724) 733-1799

LABORATORY REPORT

Report amended 12/07/2011 to include sampling date.

Rev. 01

RJ Lee Group, Inc.
350 Hochberg Road
Monroeville, PA 15146

Attn: Kristy Anderson
Phone: 724-325-1776

Email: kanderson@rjlg.com

RJ Lee Group Job No.: RLH108271
RJ Lee Group Chemistry Job No.: IN23082011P010
Samples Received: August 23, 2011
Report Date: August 26, 2011
Client Project: N/A
Purchase Order No.: N/A
Matrix: Wipe
Prep/Analysis: EPA 3050B / EPA 6010C (Wipes)-PA

Client Sample ID	RJ Lee Group ID	Sampling Date	Analyte	Wipe Area (100 cm²)	Sample Concentration		Minimum Reporting Limit		Analysis Date	Q
					Total µg	µg/100 cm²	Total µg	µg/100 cm²		

Analyst Comments:

Report Qualifiers (Q):
H = Holding times for preparation or analysis exceeded
P = NELAC analyte certification pending*
N = Analyte not NELAC certified*
**NELAC-National Environmental Laboratory Accreditation Conference*
E = Value above highest calibration standard
J = Value below lowest calibration standard but above MDL (Method Detection Limit)
L = LCS (Laboratory Control Standard)/SRM (Standard Reference Material) recover outside accepted recovery limits
B = Analyte detected in the associated Method Blank
S = Spike Recovery outside accepted limits
R = RPD (relative percent difference) outside accepted limits
D = RL (reporting limit verification) outside accepted limits

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any samples. This laboratory operates in accord with ISO 17025:2005 guidelines, and holds a limited scope of accreditation under AIHA Lab ID 100364, NY ELAP Lab Code 10884, EPA Lab Code PA00162, CA ELAP Certificate 1970, PA DEP Lab ID 02-00396, VA DCLS Lab ID 00297, and LA DEQ Agency Interest 94775. This report may not be used to claim product endorsement by any laboratory accrediting agency. The results contained in this report relate only to the items tested or to the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be valid.
Quality Control data is available upon request. Results have not been blank corrected unless otherwise noted. Samples were received in good condition unless otherwise noted.

Philip Grindle
Philip Grindle
Laboratory Supervisor

Appendix F

Dust Characterization using Microscopy Techniques

Adhesive Stub Samples – SEM/EDS Analysis

Each adhesive stub sample was examined in the SEM at magnifications ranging from 25x to 3000x using the secondary and backscattered signals. Specific compositional information was obtained through collection and processing of characteristic X-rays using an energy dispersive X-ray spectroscopy (EDS) system. Individual particles were analyzed using EDS techniques and classified based on morphology and elemental composition. A minimum of 100 random particles were characterized to determine the predominant particle types associated with the dust(s). A summary of the particle classifications is presented in Table F1.

Table F1. Summary of SEM/EDS Particle Classifications – Adhesive Stubs

Particle Class (consistent with)	Pants (3078522) No. of Occurrences	Shirt (3078530) No. of Occurrences
Mineral Wool	26	17
Ca/S-rich (e.g., gypsum)	29	30
Ca-rich (e.g., Calcite)	13	17
Ca/Mg-rich (e.g., Dolomite)	1	4
Si-rich (e.g., silica)	2	7
Si/Al-rich (e.g., soils/clays)	6	11
C-rich fiber (e.g., cellulose)	4	1
Glass Fragment	1	1
Glass Fiber	-	4
Perlite	-	2
Vermiculite	5	-
Ca/Si-rich (possible cement)	7	14
C-rich flakes/particles	-	2
Fe-rich	4	3
Zn-rich	1	-
High Temp. Si/Al-rich	1	-
Pb-rich	-	1
Sr/S-rich	-	1
Chrysotile Asbestos	5	4
Amphibole	-	1
Totals	105	120

During the SEM evaluation of the samples, representative SEM images and EDS spectra were obtained. The following figures 1 through 15 illustrate images and spectra for some of the particle categories presented in Table F1.

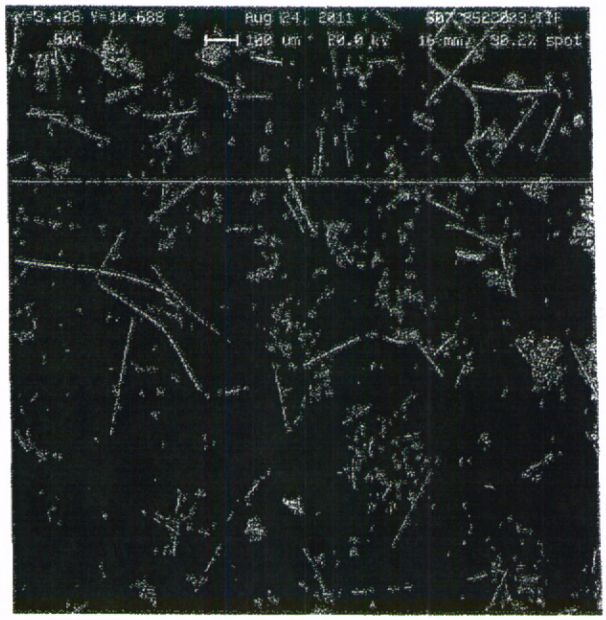


Figure 1. SEM field view of dust particles obtained on adhesive stub from uniform pants.

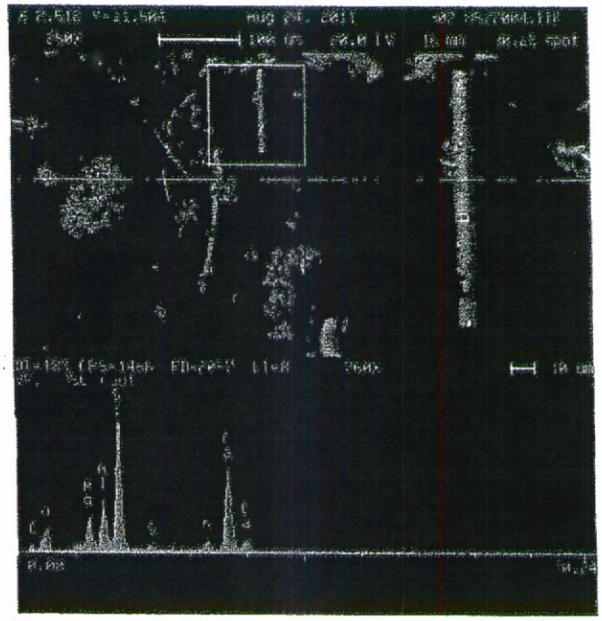


Figure 2. Mineral wool particle images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

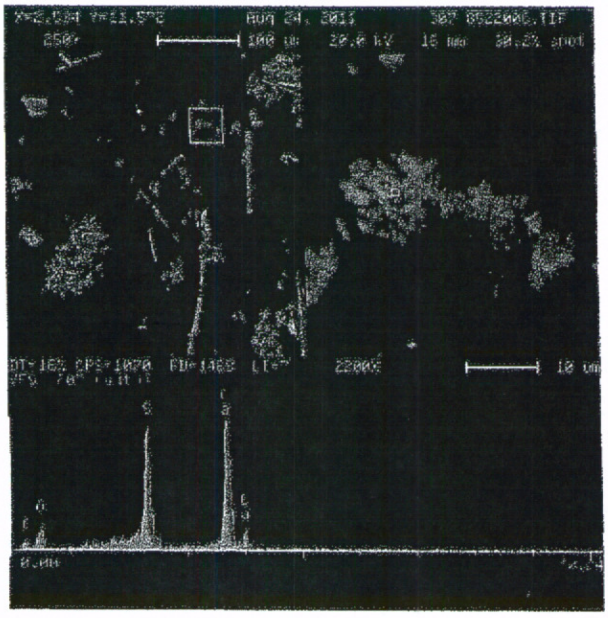


Figure 3. Ca/S-rich particle (e.g., gypsum) images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

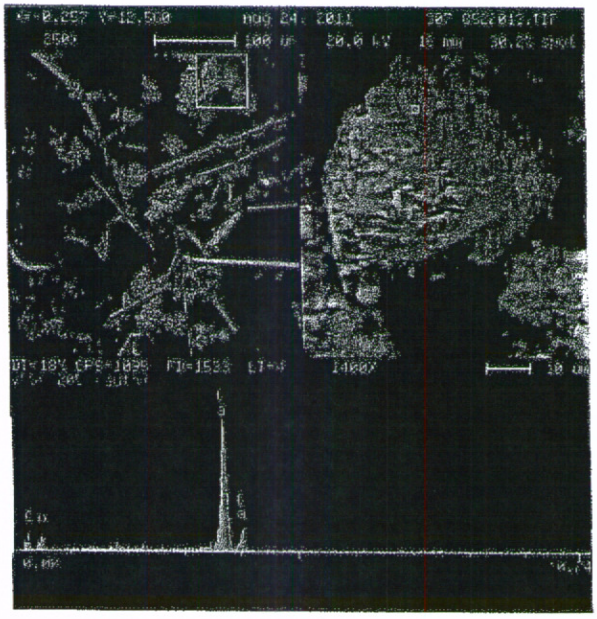


Figure 4. Ca-rich particle (e.g., calcite) images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

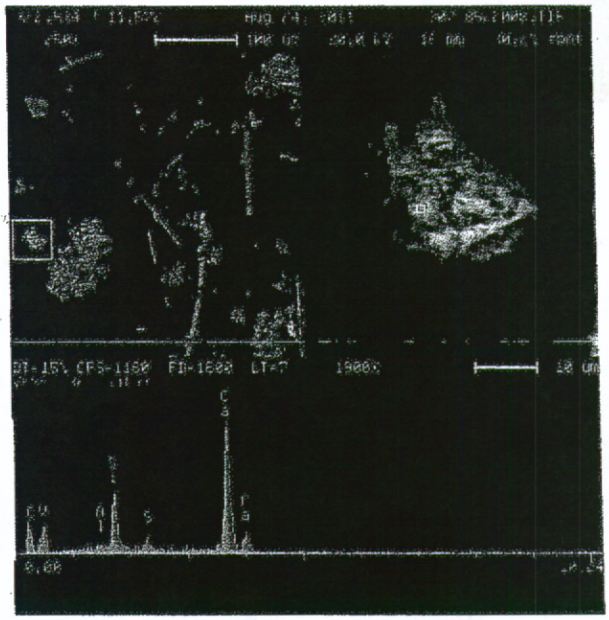


Figure 5. Ca/Si-rich particle (e.g., possible cement) images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

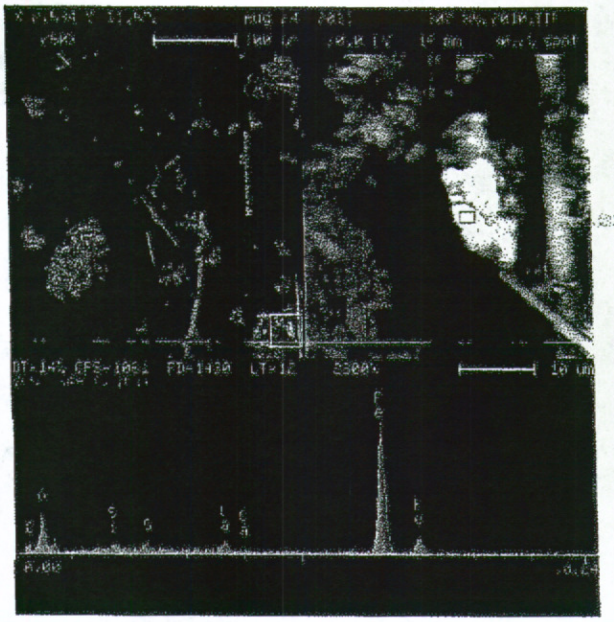


Figure 6. Fe-rich particle images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

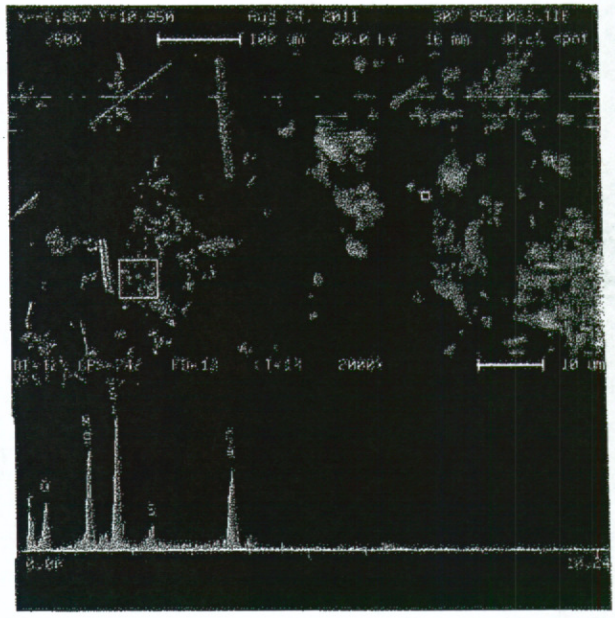


Figure 7. Chrysotile bundle with Ca/S-rich matrix images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

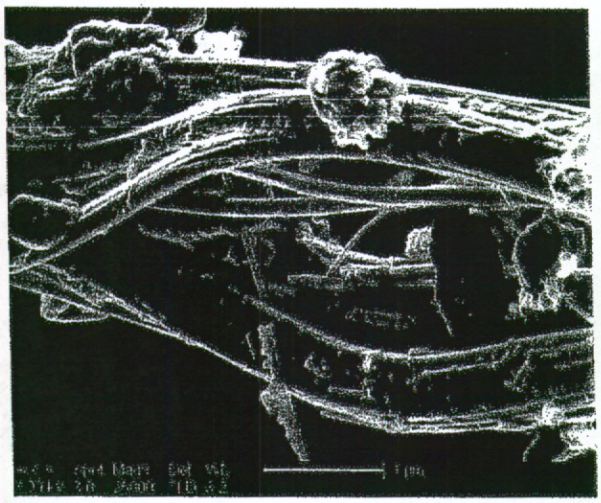


Figure 8. High magnification SEM image of chrysotile fibers with matrix material from adhesive stub obtained from uniform pants.

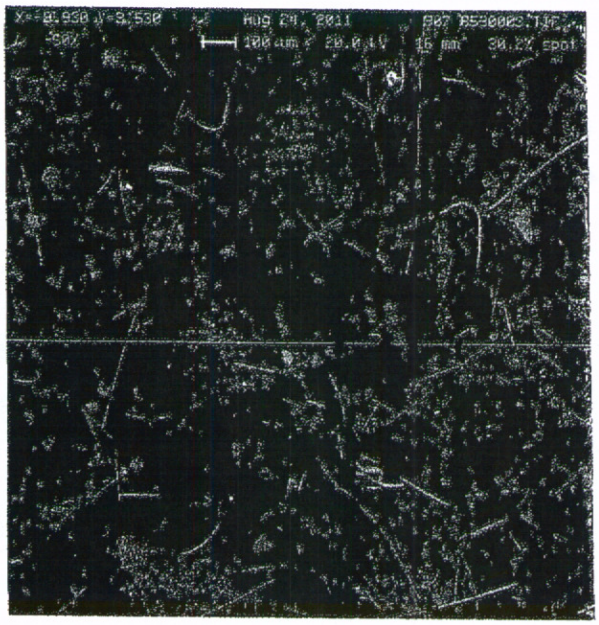


Figure 9. SEM field view of dust particles obtained on adhesive stub from uniform shirt.

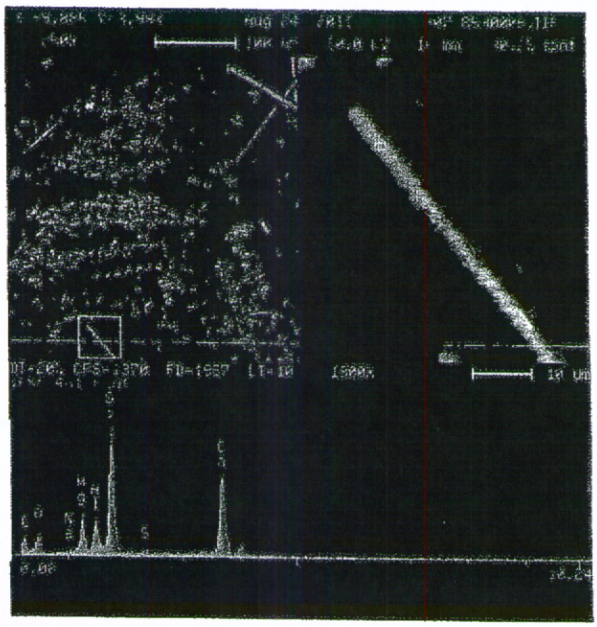


Figure 10. Mineral wool particle images and EDS spectrum from SEM adhesive stub obtained from uniform shirt.

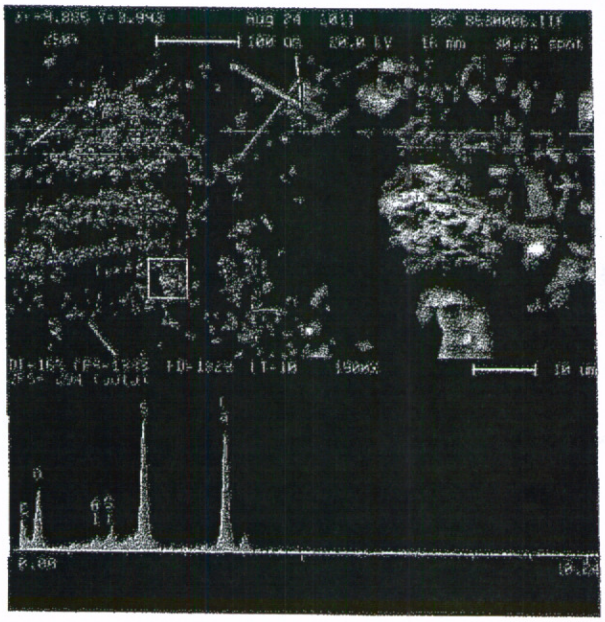


Figure 11. Ca/S-rich particle (e.g., gypsum) images and EDS spectrum from SEM adhesive stub obtained from uniform shirt.

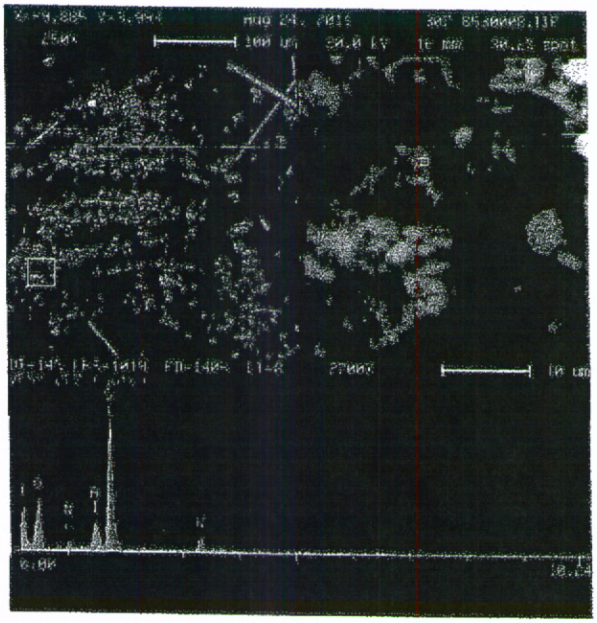


Figure 12. Ca-rich particle (e.g., calcite) images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

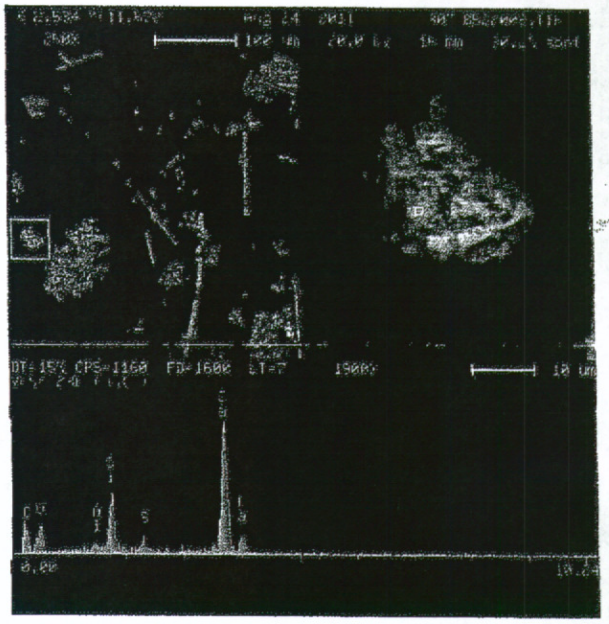


Figure 13. Perlite particle images and EDS spectrum from SEM adhesive stub obtained from uniform shirt.

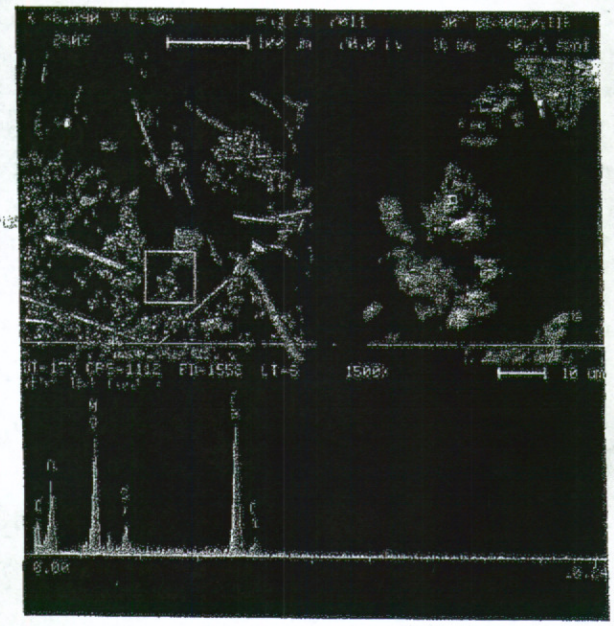


Figure 14. Ca/Mg-rich (e.g., dolomite) particle images and EDS spectrum From SEM adhesive stub obtained from uniform pants.

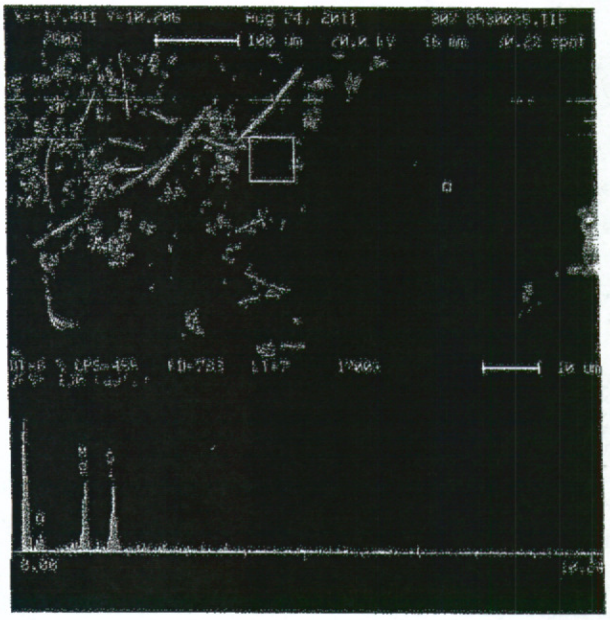


Figure 15. Chrysotile fibers (bundle) images and EDS spectrum from SEM adhesive stub obtained from uniform pants.

Adhesive Strip Samples – PLM Analysis

The dust particles collected on the adhesive strip samples were analyzed using transmitted polarized light microscopy (PLM) methods. Particles were classified based on physical optical light properties including: color, size, morphology, refractive index, birefringence, isotropism/anisotropism and extinction characteristics.

Both the dust samples from the shirt and pants contained major amounts of mineral wool and fine particulates (e.g., carbonates and gypsum) along with lesser amounts of cellulose fibers, synthetic fibers and fly-ash. One large vermiculite flake was associated with the sample obtained from the pants (3078523) and one chrysotile bundle was observed on the sample obtained from the shirt (3078531). Figures 16-18 illustrate some of the particle types detected during the PLM analyses.

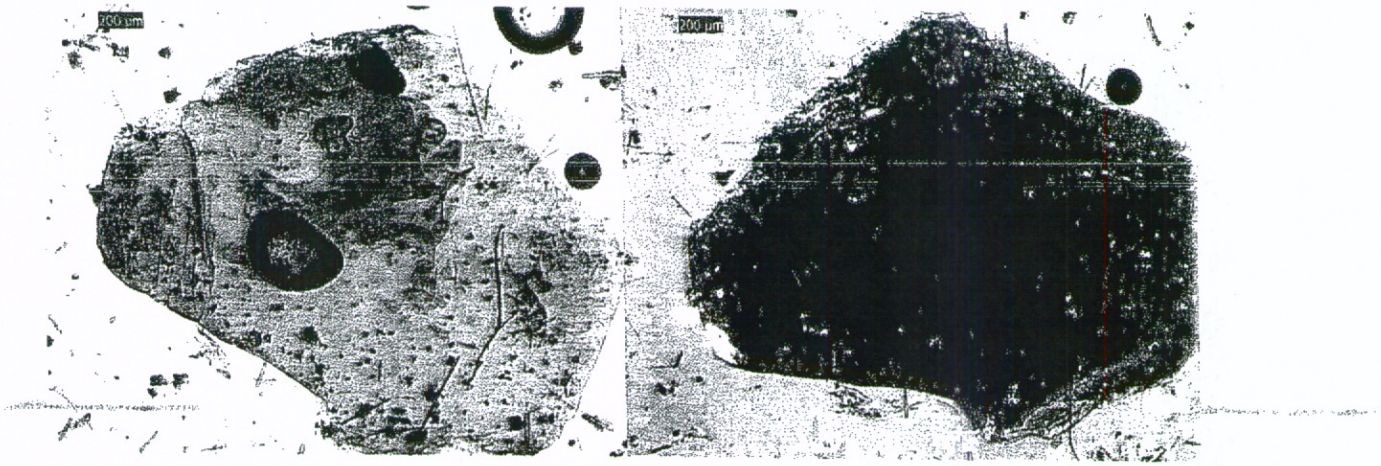


Figure 16. Photomicrographs of particles in 3078523 (pant front) in both plane-polarized and cross-polarized light in 1.550 refractive index oil. The photograph illustrates one large vermiculite flake and numerous smaller mineral wool fibers.

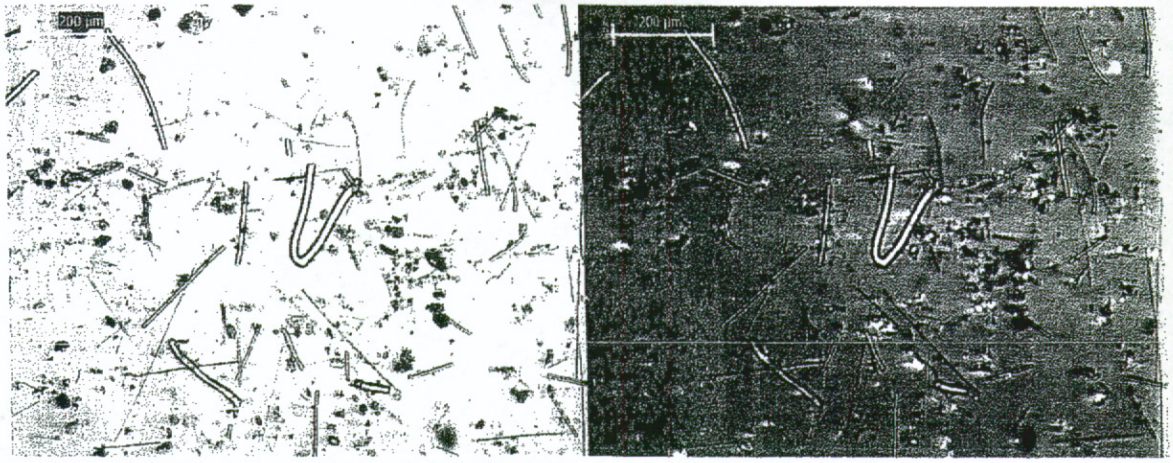


Figure 17. Photomicrographs of particles in 3078531 (shirt front) in both plane-polarized and cross-polarized light in 1.550 refractive index oil. The photograph illustrates on numerous mineral wool fibers along with fine grained "carbonates" and opaques.

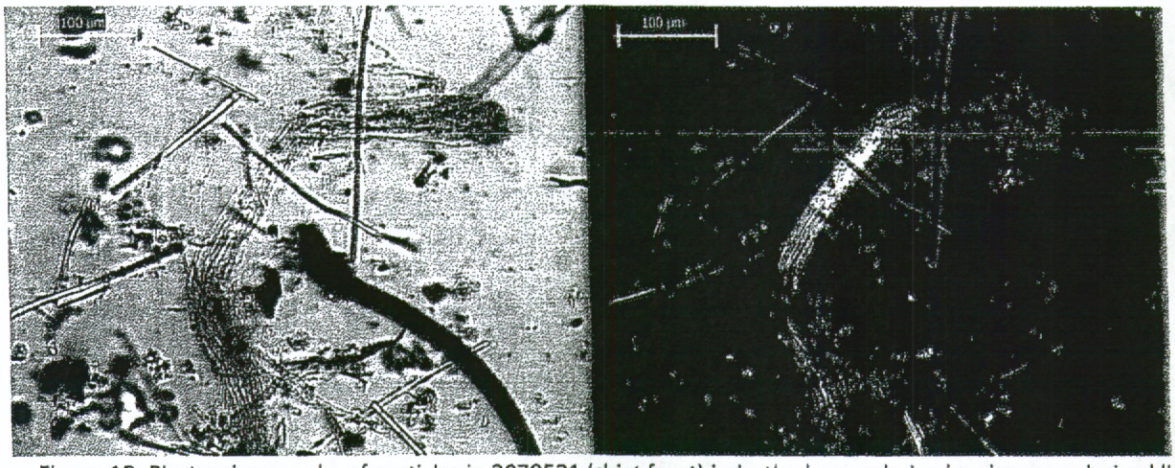


Figure 18. Photomicrographs of particles in 3078531 (shirt front) in both plane-polarized and cross-polarized light in 1.550 refractive index oil. The photograph illustrates on numerous mineral wool fibers, one chrysotile bundle and a dark synthetic fiber.

Appendix G
PNAs and PCBs Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

TestAmerica Job ID: 180-3166-1
Client Project/Site: Analytical Support
Revision: 2

For:
R J Lee Group Inc
350 Hochberg Road
Monroeville, Pennsylvania 15146-1516

Attn: Keith Rickabaugh

Authorized for release by:
11/9/2011 3:32:47 PM
Christina Kovitch
Project Manager II
chris.kovitch@testamericainc.com

Designee for

Ryan Hall
Customer Service Manager
ryan.hall@testamericainc.com

Table of Contents

3

Job ID: 180-3166-1

Laboratory: TestAmerica Pittsburgh

Narrative

Job Narrative
180-3166-1

Note: Report reissued per client request due to incorrect 8270List was provided.

Receipt
A chain of custody was not received with the samples, but a letter with requested analysis was we signed off and used as COC.

The samples were received at ambient temperature.

Date and time collected were not listed on the bottles nor the letter. The sample date of 8/18 was used for log-in purposes.

GC/MS Semi VOA
The following samples were diluted due to the nature of the sample matrix: 3078516 (180-3166-3), 3078524 (180-3166-4). Elevated reporting limits (RLs) are provided.

GC Semi VOA
Method 8082: DCB exceeded QC limit due to matrix of the samples, TCMX was acceptable and data is reportable as per SOP.

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: R J Lee Group Inc
Project/Site: Analytical Support

TestAmerica Job ID: 180-3166-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Pittsburgh	ACLASS	DoD ELAP		ADE-1422
TestAmerica Pittsburgh	Arkansas	State Program	6	88-0690
TestAmerica Pittsburgh	California	NELAC	9	4224CA
TestAmerica Pittsburgh	Connecticut	State Program	1	PH-0688
TestAmerica Pittsburgh	Florida	NELAC	4	E871008
TestAmerica Pittsburgh	Illinois	NELAC	5	002602
TestAmerica Pittsburgh	Kansas	NELAC	7	E-10350
TestAmerica Pittsburgh	Louisiana	NELAC	6	04041
TestAmerica Pittsburgh	New Hampshire	NELAC	1	203011
TestAmerica Pittsburgh	New Jersey	NELAC	2	PA005
TestAmerica Pittsburgh	New York	NELAC	2	11182
TestAmerica Pittsburgh	North Carolina	North Carolina DENR	4	434
TestAmerica Pittsburgh	Pennsylvania	NELAC	3	02-00416
TestAmerica Pittsburgh	Pennsylvania	State Program	3	02-416
TestAmerica Pittsburgh	South Carolina	State Program	4	89014002
TestAmerica Pittsburgh	USDA	USDA		P330-10-00139
TestAmerica Pittsburgh	USDA	USDA		P-Soil-01
TestAmerica Pittsburgh	Utah	NELAC	8	STLP
TestAmerica Pittsburgh	Virginia	NELAC	3	460189
TestAmerica Pittsburgh	West Virginia	West Virginia DEP	3	142
TestAmerica Pittsburgh	Wisconsin	State Program	5	998027800

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

5

Sample Summary

Client: R J Lee Group Inc
Project/Site: Analytical Support

TestAmerica Job ID: 180-3166-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-3166-5	3078517	Wipe	08/18/11 00:00	08/19/11 10:00
180-3166-6	3078525	Wipe	08/18/11 00:00	08/19/11 10:00
180-3166-7	3078516	Wipe	08/18/11 00:00	08/19/11 10:00
180-3166-8	~~3078517~~	Wipe	08/18/11 00:00	08/19/11 10:00

524

KAN 12/14/11

6

Method Summary

Client: R J Lee Group Inc
Project/Site: Analytical Support

TestAmerica Job ID: 180-3166-1

Method	Method Description	Protocol	Laboratory
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL PIT
8082	Polychlorinated Biphenyls (PCBs) (GC)	SW846	TAL PIT

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

7

Client Sample ID: 3078517
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 10:00

Lab Sample ID: 180-3166-5
Matrix: Wipe

Method: 8082 - Polychlorinated Biphenyls (PCBs) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.025	0.0021	ug/Wipe		08/27/11 07:51	08/27/11 20:16	1
PCB-1221	ND		0.025	0.0027	ug/Wipe		08/27/11 07:51	08/27/11 20:16	1
PCB-1232	ND		0.025	0.0024	ug/Wipe		08/27/11 07:51	08/27/11 20:16	1
PCB-1242	ND		0.025	0.0023	ug/Wipe		08/27/11 07:51	08/27/11 20:16	1
PCB-1248	ND		0.025	0.0013	ug/Wipe		08/27/11 07:51	08/27/11 20:16	1
PCB-1254	ND		0.025	0.0020	ug/Wipe		08/27/11 07:51	08/27/11 20:16	1
PCB-1260	0.13		0.025	0.0020	ug/Wipe		08/27/11 07:51	08/27/11 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*4225*	*E*		*08/27/11 07:51*	*08/27/11 20:16*	*1*
Tetrachloro-m-xylene	*84*			*08/27/11 07:51*	*08/27/11 20:16*	*1*

Client Sample ID: 3078525
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 10:00

Lab Sample ID: 180-3166-6
Matrix: Wipe

Method: 8082 - Polychlorinated Biphenyls (PCBs) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.025	0.0021	ug/Wipe		08/27/11 07:51	08/27/11 20:45	1
PCB-1221	ND		0.025	0.0027	ug/Wipe		08/27/11 07:51	08/27/11 20:45	1
PCB-1232	ND		0.025	0.0024	ug/Wipe		08/27/11 07:51	08/27/11 20:45	1
PCB-1242	ND		0.025	0.0023	ug/Wipe		08/27/11 07:51	08/27/11 20:45	1
PCB-1248	ND		0.025	0.0013	ug/Wipe		08/27/11 07:51	08/27/11 20:45	1
PCB-1254	ND		0.025	0.0020	ug/Wipe		08/27/11 07:51	08/27/11 20:45	1
PCB-1260	0.12		0.025	0.0020	ug/Wipe		08/27/11 07:51	08/27/11 20:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*616*			*08/27/11 07:51*	*08/27/11 20:45*	*1*
Tetrachloro-m-xylene	*100*			*08/27/11 07:51*	*08/27/11 20:45*	*1*

Client Sample ID: 3078516
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 10:00

Lab Sample ID: 180-3166-7
Matrix: Wipe

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	30	U	30	2.2	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Acenaphthylene	30	U	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Anthracene	30	U	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Benzo[a]anthracene	3.0	J	30	2.2	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Benzo[a]pyrene	2.7	J	30	2.0	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Benzo[b]fluoranthene	4.3	J	30	2.4	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Benzo[g,h,i]perylene	2.6	J	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Benzo[k]fluoranthene	30	U	30	8.2	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Chrysene	2.9	J	30	2.1	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Dibenz(a,h)anthracene	30	U	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Fluoranthene	6.0	J	30	2.4	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Fluorene	30	U	30	3.2	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Indeno[1,2,3-cd]pyrene	30	U	30	3.0	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30

Client Sample ID: 3078516
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 10:00

Lab Sample ID: 180-3166-7
Matrix: Wipe

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	2.1	J	30	2.1	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Phenanthrene	7.8	J	30	6.4	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30
Pyrene	3.2	J	30	2.4	ug/Wipe		08/27/11 07:46	08/27/11 21:57	30

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	88		39 - 115	08/27/11 07:46	08/27/11 21:57	30
2-Fluorobiphenyl	80		35 - 115	08/27/11 07:46	08/27/11 21:57	30
Terphenyl-d14	72		17 - 129	08/27/11 07:46	08/27/11 21:57	30

8

Client Sample ID: 3078517 524
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 10:00

KAM 12/14/11

Lab Sample ID: 180-3166-8
Matrix: Wipe

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	30	U	30	2.2	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Acenaphthylene	30	U	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Anthracene	30	U	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Benzo[a]anthracene	30	U	30	2.2	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Benzo[a]pyrene	30	U	30	2.0	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Benzo[b]fluoranthene	30	U	30	2.4	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Benzo[g,h,i]perylene	30	U	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Benzo[k]fluoranthene	30	U	30	8.2	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Chrysene	30	U	30	2.1	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Dibenz(a,h)anthracene	30	U	30	2.3	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Fluoranthene	30	U	30	2.4	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Fluorene	30	U	30	3.2	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Indeno[1,2,3-cd]pyrene	30	U	30	3.0	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Naphthalene	30	U	30	2.1	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Phenanthrene	30	U	30	6.4	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30
Pyrene	30	U	30	2.4	ug/Wipe		08/27/11 07:46	08/27/11 22:19	30

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	63		39 - 115	08/27/11 07:46	08/27/11 22:19	30
2-Fluorobiphenyl	57		35 - 115	08/27/11 07:46	08/27/11 22:19	30
Terphenyl-d14	51		17 - 129	08/27/11 07:46	08/27/11 22:19	30

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 180-19942/1-A
Matrix: Wipe
Analysis Batch: 12183

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 19942

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	1.0	U	1.0	0.072	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Acenaphthylene	1.0	U	1.0	0.076	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Anthracene	1.0	U	1.0	0.077	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Benzo[a]anthracene	1.0	U	1.0	0.074	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Benzo[a]pyrene	1.0	U	1.0	0.067	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Benzo[b]fluoranthene	1.0	U	1.0	0.079	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Benzo[g,h,i]perylene	1.0	U	1.0	0.076	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Benzo[k]fluoranthene	1.0	U	1.0	0.27	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Chrysene	1.0	U	1.0	0.070	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Dibenz(a,h)anthracene	1.0	U	1.0	0.078	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Fluoranthene	1.0	U	1.0	0.081	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Fluorene	1.0	U	1.0	0.11	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Indeno[1,2,3-cd]pyrene	1.0	U	1.0	0.10	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Naphthalene	1.0	U	1.0	0.070	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Phenanthrene	1.0	U	1.0	0.21	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1
Pyrene	1.0	U	1.0	0.079	ug/Wipe		08/27/11 07:46	08/27/11 13:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Nitrobenzene-d5	*80*		*39 - 115*	*08/27/11 07:46*	*08/27/11 13:38*	*1*
2-Fluorobiphenyl	*71*		*35 - 115*	*08/27/11 07:46*	*08/27/11 13:38*	*1*
Terphenyl-d14	*69*		*17 - 129*	*08/27/11 07:46*	*08/27/11 13:38*	*1*

Lab Sample ID: LCS 180-19942/2-A
Matrix: Wipe
Analysis Batch: 12183

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 19942

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	10.0	7.71		ug/Wipe		77	41 - 115
Acenaphthylene	10.0	7.95		ug/Wipe		79	20 - 143
Anthracene	10.0	7.74		ug/Wipe		77	27 - 133
Benzo[a]anthracene	10.0	7.31		ug/Wipe		73	33 - 143
Benzo[a]pyrene	10.0	8.09		ug/Wipe		81	17 - 163
Benzo[b]fluoranthene	10.0	8.12		ug/Wipe		81	24 - 159
Benzo[g,h,i]perylene	10.0	7.57		ug/Wipe		76	1 - 219
Benzo[k]fluoranthene	10.0	7.02		ug/Wipe		70	11 - 162
Chrysene	10.0	6.94		ug/Wipe		69	17 - 168
Dibenz(a,h)anthracene	10.0	6.98		ug/Wipe		70	1 - 227
Fluoranthene	10.0	8.55		ug/Wipe		86	26 - 137
Fluorene	10.0	8.03		ug/Wipe		80	43 - 112
Indeno[1,2,3-cd]pyrene	10.0	7.33		ug/Wipe		73	1 - 171
Naphthalene	10.0	8.10		ug/Wipe		81	33 - 118
Phenanthrene	10.0	7.97		ug/Wipe		80	54 - 120
Pyrene	10.0	6.89		ug/Wipe		69	35 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Nitrobenzene-d5	*75*		*39 - 115*
2-Fluorobiphenyl	*69*		*35 - 115*
Terphenyl-d14	*64*		*17 - 129*

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 180-19942/3-A
Matrix: Wipe
Analysis Batch: 12183

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 19942

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	10.0	7.32		ug/Wipe		73	41 - 115	5	35
Acenaphthylene	10.0	7.78		ug/Wipe		78	20 - 143	2	41
Anthracene	10.0	7.42		ug/Wipe		74	27 - 133	4	22
Benzo[a]anthracene	10.0	7.14		ug/Wipe		71	33 - 143	2	23
Benzo[a]pyrene	10.0	7.78		ug/Wipe		78	17 - 163	4	31
Benzo[b]fluoranthene	10.0	7.98		ug/Wipe		80	24 - 159	2	28
Benzo[g,h,i]perylene	10.0	7.37		ug/Wipe		74	1 - 219	3	50
Benzo[k]fluoranthene	10.0	6.89		ug/Wipe		69	11 - 162	2	31
Chrysene	10.0	6.95		ug/Wipe		69	17 - 168	0	31
Dibenz(a,h)anthracene	10.0	6.84		ug/Wipe		68	1 - 227	2	55
Fluoranthene	10.0	8.42		ug/Wipe		84	26 - 137	2	23
Fluorene	10.0	7.68		ug/Wipe		77	43 - 112	4	29
Indeno[1,2,3-cd]pyrene	10.0	7.29		ug/Wipe		73	1 - 171	0	37
Naphthalene	10.0	7.54		ug/Wipe		75	33 - 118	7	35
Phenanthrene	10.0	7.59		ug/Wipe		76	54 - 120	5	20
Pyrene	10.0	6.56		ug/Wipe		66	35 - 127	5	41

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Nitrobenzene-d5	*72*		*39 - 115*
2-Fluorobiphenyl	*68*		*35 - 115*
Terphenyl-d14	*65*		*17 - 129*

Method: 8082 - Polychlorinated Biphenyls (PCBs) (GC)

Lab Sample ID: MB 180-15625/1-A
Matrix: Wipe
Analysis Batch: 15654

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 15625

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.025	0.0021	ug/Wipe		08/27/11 07:51	08/27/11 21:14	1
PCB-1221	ND		0.025	0.0027	ug/Wipe		08/27/11 07:51	08/27/11 21:14	1
PCB-1232	ND		0.025	0.0024	ug/Wipe		08/27/11 07:51	08/27/11 21:14	1
PCB-1242	ND		0.025	0.0023	ug/Wipe		08/27/11 07:51	08/27/11 21:14	1
PCB-1248	ND		0.025	0.0013	ug/Wipe		08/27/11 07:51	08/27/11 21:14	1
PCB-1254	ND		0.025	0.0020	ug/Wipe		08/27/11 07:51	08/27/11 21:14	1
PCB-1260	ND		0.025	0.0020	ug/Wipe		08/27/11 07:51	08/27/11 21:14	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*123*			*08/27/11 07:51*	*08/27/11 21:14*	*1*
Tetrachloro-m-xylene	*125*			*08/27/11 07:51*	*08/27/11 21:14*	*1*

Lab Sample ID: LCS 180-15625/2-A
Matrix: Wipe
Analysis Batch: 15654

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 15625

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
PCB-1016	1.00	0.986		ug/Wipe		99	
PCB-1260	1.00	0.999		ug/Wipe		100	

Method: 8082 - Polychlorinated Biphenyls (PCBs) (GC) (Continued)

Lab Sample ID: LCS 180-15625/2-A
Matrix: Wipe
Analysis Batch: 15654

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 15625

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	134		
Tetrachloro-m-xylene	128		

Lab Sample ID: LCSD 180-15625/3-A
Matrix: Wipe
Analysis Batch: 15654

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 15625

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016			1.00	1.22		ug/Wipe		122		21.4	
PCB-1260			1.00	1.25		ug/Wipe		125		22.3	

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	130		
Tetrachloro-m-xylene	122		

QC Association Summary

Client: R J Lee Group Inc
Project/Site: Analytical Support

TestAmerica Job ID: 180-3166-1

GC/MS Semi VOA

Analysis Batch: 12183

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-3166-7	3078516	Total/NA	Wipe	8270C	19942
180-3166-8	3078517 3078524	Total/NA	Wipe	8270C	19942
LCS 180-19942/2-A	Lab Control Sample	Total/NA	Wipe	8270C	19942
LCSD 180-19942/3-A	Lab Control Sample Dup	Total/NA	Wipe	8270C	19942
MB 180-19942/1-A	Method Blank	Total/NA	Wipe	8270C	19942

KW 12/14/11

Prep Batch: 19942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-3166-7	3078516	Total/NA	Wipe	3541	
180-3166-8	3078517 3078524	Total/NA	Wipe	3541	
LCS 180-19942/2-A	Lab Control Sample	Total/NA	Wipe	3541	
LCSD 180-19942/3-A	Lab Control Sample Dup	Total/NA	Wipe	3541	
MB 180-19942/1-A	Method Blank	Total/NA	Wipe	3541	

KW 12/14/11

GC Semi VOA

Prep Batch: 15625

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-3166-5	3078517	Total/NA	Wipe	3541	
180-3166-6	3078525	Total/NA	Wipe	3541	
LCS 180-15625/2-A	Lab Control Sample	Total/NA	Wipe	3541	
LCSD 180-15625/3-A	Lab Control Sample Dup	Total/NA	Wipe	3541	
MB 180-15625/1-A	Method Blank	Total/NA	Wipe	3541	

Analysis Batch: 15654

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-3166-5	3078517	Total/NA	Wipe	8082	15625
180-3166-6	3078525	Total/NA	Wipe	8082	15625
LCS 180-15625/2-A	Lab Control Sample	Total/NA	Wipe	8082	15625
LCSD 180-15625/3-A	Lab Control Sample Dup	Total/NA	Wipe	8082	15625
MB 180-15625/1-A	Method Blank	Total/NA	Wipe	8082	15625

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

3166 AMB

August 18, 2011

Pittsburgh Laboratory
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
412.963.7058 Fax: 412.963.2468

There will be two swatch samples for PCBs Sample# 3078517 and #3078525

Two samples for PNAs, Sample #3078516 and #3078524

Analysis Request:

PCBs by 8082 (common aroclors – total ug/sample basis)- Sample# 3078517 and #3078525

PNAs by GC/MS (17 – report on total ug/sample and BAP-TEF basis/sample) - Sample #3078516 and #3078524

Please have all results reported to me and reference the RLH108271

Results are to be due Aug 26th 2011

We should process samples as we did many years ago for WTC Dust analyses.

Keith Rickabaugh
Technical Director, Materials & Analytical Services

RJ Lee Group, Inc.

www.rjlg.com

724.325.1776 Office
724.387.1841 Direct
724.309.6732 Mobile
724.733.1799 Fax

350 Hochberg Road | Monroeville, PA 15146

900

[redacted]

FedEx First Overnight®

From: (724) 325-1919
Kristy Anderson
RJ Lee Group, Inc.
350 Hochberg Road

Monroeville, PA 15146

Origin ID: LBEA

Ship Date: 18AUG11
ActWgt: 2.0 LB
CAD: 1180467/INET3180

Dims: 11 X 9 X 5 IN

151

Delivery Address Bar Code

SHIP TO: (412) 963-7858

BILL SENDER

Pittsburgh Laboratory
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238

Ref # RLH188271
Invoice #
PO #
Dept #

RELEASE#: 3785346

FRI - 19 AUG A2
FIRST OVERNIGHT

TRK# 0201 7974 2782 2716

65 AGCA

15238
PA-US
PIT

50FG1AEE7AF5F4

After printing this label:

[redacted]

ır inkjet printer.

he barcode portion of the label can be read and scanned.

11/9/2011

Login Sample Receipt Checklist

Client: R J Lee Group Inc

Job Number: 180-3166-1

Login Number: 3166
List Number: 1
Creator: Oakley, Jason

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	False	Refer to Job Narrative for details.
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice per client request.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	False	Refer to Job Narrative for details.
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	No date or time on COC, logged in per contianer labels.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix H
Dioxins and Furans

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica West Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: G1H220451
Client Project Description: Fabric samples

For:
R J Lee Group Inc
350 Hochberg Road
Monroeville, PA 15146-1516

Attn: Keith Rickabaugh

Jill Kellmann

Authorized for release by:
08/30/2011 05:35:26 PM

Jill Kellmann
Project Manager
jill.kellmann@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Table of Contents

Definitions/Glossary

Qualifiers

DIOXIN

Qualifier	Qualifier Description
J	Estimated result. Result is less than the reporting limit.
Q	Estimated maximum possible concentration (EMPC).
B	Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit (Dioxin)
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or method detection limit if shown)
PQL	Practical Quantitation Limit
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

TestAmerica West Sacramento Project Number G1H220451

4

8290, Dioxins/Furans, Isomers
Samples: 1, 2
Several analytes in each sample and the method blank have been qualified with a "Q" flag because the ion abundance ratios are outside of criteria. The analytes have been reported as an "estimated maximum possible concentration" (EMPC) because the quantitation is based on the theoretical ion abundance ratio for these analytes.

There are no other anomalies associated with this project.

Detection Summary

Client: R J Lee Group Inc

TestAmerica Job ID: G1H220451

Client Sample ID: 3078518

Lab Sample ID: G1H220451001

Analyte	Result	Qualifier	ML	EDL	TEF	TEQ	Unit	Dil Fac	D	Method	Prep Type
1,2,3,4,6,7,8-HpCDD	48	J Q B	500	16	0.01	0.48	pg	10		8290	Total
OCDD	920	J B	1000	36	0.0003	0.28	pg	10		8290	Total
2,3,7,8-TCDF	13	J Q	100	10	0.1	1.3	pg	10		8290	Total
1,2,3,4,7,8-HxCDF	55	J B	500	13	0.1	5.5	pg	10		8290	Total
OCDF	120	J Q	1000	30	0.0003	0.036	pg	10		8290	Total

Client Sample ID: 3078526

Lab Sample ID: G1H220451002

Analyte	Result	Qualifier	ML	EDL	TEF	TEQ	Unit	Dil Fac	D	Method	Prep Type
OCDD	590	J B	1000	32	0.0003	0.18	pg	10		8290	Total
1,2,3,4,7,8-HxCDF	41	J B	500	11	0.1	4.1	pg	10		8290	Total
2,3,4,6,7,8-HxCDF	10	J	500	9.9	0.1	1.0	pg	10		8290	Total
OCDF	59	J	1000	23	0.0003	0.018	pg	10		8290	Total

5

Client Sample ID: 3078518
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 09:00

Lab Sample ID: G1H220451001
Matrix: Wipe

Method: 8290 - Dioxins/Furans, HRGC/HRMS (8290)

Analyte	Result	Qualifier	ML	EDL	TEF	TEQ	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		100	14	1		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,7,8-PeCDD	ND		500	13	1		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,4,7,8-HxCDD	ND		500	11	0.1		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,6,7,8-HxCDD	ND		500	8.1	0.1		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,7,8,9-HxCDD	ND		500	9.1	0.1		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,4,6,7,8-HpCDD	48	J Q B	500	16	0.01	0.48	pg		08/22/11 11:00	08/25/11 08:55	10
OCDD	920	J B	1000	36	0.0003	0.28	pg		08/22/11 11:00	08/25/11 08:55	10
2,3,7,8-TCDF	13	J Q	100	10	0.1	1.3	pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,7,8-PeCDF	ND		500	16	0.03		pg		08/22/11 11:00	08/25/11 08:55	10
2,3,4,7,8-PeCDF	ND		500	17	0.3		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,4,7,8-HxCDF	55	J B	500	13	0.1	5.5	pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,6,7,8-HxCDF	ND		500	10	0.1		pg		08/22/11 11:00	08/25/11 08:55	10
2,3,4,6,7,8-HxCDF	ND		500	12	0.1		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,7,8,9-HxCDF	ND		500	14	0.1		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,4,6,7,8-HpCDF	ND		500	110	0.01		pg		08/22/11 11:00	08/25/11 08:55	10
1,2,3,4,7,8,9-HpCDF	ND		500	22	0.01		pg		08/22/11 11:00	08/25/11 08:55	10
OCDF	120	J Q	1000	30	0.0003	0.036	pg		08/22/11 11:00	08/25/11 08:55	10
Total TEQ (WHO 2005)						7.6					

Internal Standard	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*64*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-1,2,3,7,8-PeCDD	*65*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-1,2,3,6,7,8-HxCDD	*67*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-1,2,3,4,6,7,8-HpCDD	*62*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-OCDD	*65*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-2,3,7,8-TCDF	*67*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-1,2,3,7,8-PeCDF	*73*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-1,2,3,4,7,8-HxCDF	*77*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*
13C-1,2,3,4,6,7,8-HpCDF	*68*		*40 - 135*	*08/22/11 11:00*	*08/25/11 08:55*	*10*

Client Sample ID: 3078526
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 09:00

Lab Sample ID: G1H220451002
Matrix: Wipe

Method: 8290 - Dioxins/Furans, HRGC/HRMS (8290)

Analyte	Result	Qualifier	ML	EDL	TEF	TEQ	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		100	11	1		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,7,8-PeCDD	ND		500	13	1		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,4,7,8-HxCDD	ND		500	11	0.1		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,6,7,8-HxCDD	ND		500	7.9	0.1		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,7,8,9-HxCDD	ND		500	8.9	0.1		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,4,6,7,8-HpCDD	ND		500	29	0.01		pg		08/22/11 11:00	08/25/11 09:47	10
OCDD	590	J B	1000	32	0.0003	0.18	pg		08/22/11 11:00	08/25/11 09:47	10
2,3,7,8-TCDF	ND		100	15	0.1		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,7,8-PeCDF	ND		500	14	0.03		pg		08/22/11 11:00	08/25/11 09:47	10
2,3,4,7,8-PeCDF	ND		500	14	0.3		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,4,7,8-HxCDF	41	J B	500	11	0.1	4.1	pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,6,7,8-HxCDF	ND		500	8.8	0.1		pg		08/22/11 11:00	08/25/11 09:47	10
2,3,4,6,7,8-HxCDF	10	J	500	9.9	0.1	1.0	pg		08/22/11 11:00	08/25/11 09:47	10

Client: R J Lee Group Inc

TestAmerica Job ID: G1H220451

Client Sample ID: 3078526

Lab Sample ID: G1H220451002

Date Collected: 08/18/11 00:00

Matrix: Wipe

Date Received: 08/19/11 09:00

Method: 8290 - Dioxins/Furans, HRGC/HRMS (8290) (Continued)

Analyte	Result	Qualifier	ML	EDL	TEF	TEQ	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,7,8,9-HxCDF	ND		500	12	0.1		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,4,6,7,8-HpCDF	ND		500	58	0.01		pg		08/22/11 11:00	08/25/11 09:47	10
1,2,3,4,7,8,9-HpCDF	ND		500	25	0.01		pg		08/22/11 11:00	08/25/11 09:47	10
OCDF	59	J	1000	23	0.0003	0.018	pg		08/22/11 11:00	08/25/11 09:47	10
Total TEQ (WHO 2005)						5.3					

Internal Standard	*% Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*72*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-1,2,3,7,8-PeCDD	*79*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-1,2,3,6,7,8-HxCDD	*65*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-1,2,3,4,6,7,8-HpCDD	*68*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-OCDD	*67*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-2,3,7,8-TCDF	*75*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-1,2,3,7,8-PeCDF	*77*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-1,2,3,4,7,8-HxCDF	*77*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*
13C-1,2,3,4,6,7,8-HpCDF	*81*		*40 - 135*	*08/22/11 11:00*	*08/25/11 09:47*	*10*

Internal Standard Summary

Client: R J Lee Group Inc

TestAmerica Job ID: G1H220451

Method: 8290 - Dioxins/Furans, HRGC/HRMS (8290)

Matrix: Wipe

Prep Type: Total

		Percent Internal Standard Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	TCDD (40-135)	PeCDD (40-135)	HxCDD2 (40-135)	HpCDD (40-135)	OCDD (40-135)	TCDF (40-135)	PeCDF1 (40-135)	HxCDF1 (40-135)
G1H220451001	3078518	64	65	67	62	65	67	73	77
G1H220451002	3078526	72	79	65	68	67	75	77	77
G1H240000063B	Method Blank	83	76	69	78	75	75	77	82
G1H240000063C	Lab Control Sample	69	74	71	71	68	74	79	82

		Percent Internal Standard Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HpCDF1 (40-135)
G1H220451001	3078518	68
G1H220451002	3078526	81
G1H240000063B	Method Blank	79
G1H240000063C	Lab Control Sample	75

Internal Standard Legend

TCDD = 13C-2,3,7,8-TCDD

PeCDD = 13C-1,2,3,7,8-PeCDD

HxCDD2 = 13C-1,2,3,6,7,8-HxCDD

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD

OCDD = 13C-OCDD

TCDF = 13C-2,3,7,8-TCDF

PeCDF1 = 13C-1,2,3,7,8-PeCDF

HxCDF1 = 13C-1,2,3,4,7,8-HxCDF

HpCDF1 = 13C-1,2,3,4,6,7,8-HpCDF

Method: 8290 - Dioxins/Furans, HRGC/HRMS (8290)

Lab Sample ID: G1H240000063B
Matrix: Wipe
Analysis Batch: 1236063

Client Sample ID: Method Blank
Prep Type: Total
Prep Batch: 1236063_P

Analyte	MB Result	MB Qualifier	ML	EDL	TEF	TEQ	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		100	10	1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,7,8-PeCDD	ND		500	12	1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,4,7,8-HxCDD	ND		500	21	0.1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,6,7,8-HxCDD	ND		500	16	0.1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,7,8,9-HxCDD	ND		500	18	0.1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,4,6,7,8-HpCDD	20	J Q	500	13	0.01	0.20	pg		08/22/11 11:00	08/25/11 07:08	10
OCDD	24	J	1000	19	0.0003	0.0072	pg		08/22/11 11:00	08/25/11 07:08	10
2,3,7,8-TCDF	ND		100	7.3	0.1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,7,8-PeCDF	ND		500	10	0.03		pg		08/22/11 11:00	08/25/11 07:08	10
2,3,4,7,8-PeCDF	ND		500	10	0.3		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,4,7,8-HxCDF	50	J	500	8.7	0.1	5.0	pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,6,7,8-HxCDF	ND		500	7.1	0.1		pg		08/22/11 11:00	08/25/11 07:08	10
2,3,4,6,7,8-HxCDF	ND		500	8.0	0.1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,7,8,9-HxCDF	ND		500	9.8	0.1		pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,4,6,7,8-HpCDF	22	J Q	500	6.6	0.01	0.22	pg		08/22/11 11:00	08/25/11 07:08	10
1,2,3,4,7,8,9-HpCDF	39	J Q	500	7.9	0.01	0.39	pg		08/22/11 11:00	08/25/11 07:08	10
OCDF	ND		1000	15	0.0003		pg		08/22/11 11:00	08/25/11 07:08	10
Total TEQ						5.8					

Internal Standard	*MB % Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	83		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-1,2,3,7,8-PeCDD	76		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-1,2,3,6,7,8-HxCDD	69		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-1,2,3,4,6,7,8-HpCDD	78		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-OCDD	75		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-2,3,7,8-TCDF	75		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-1,2,3,7,8-PeCDF	77		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-1,2,3,4,7,8-HxCDF	82		40 - 135	08/22/11 11:00	08/25/11 07:08	10
13C-1,2,3,4,6,7,8-HpCDF	79		40 - 135	08/22/11 11:00	08/25/11 07:08	10

Lab Sample ID: G1H240000063C
Matrix: Wipe
Analysis Batch: 1236063

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 1236063_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
2,3,7,8-TCDD	400	447		pg		112	59 - 120
1,2,3,7,8-PeCDD	2000	2130		pg		107	57 - 124
1,2,3,4,7,8-HxCDD	2000	2370		pg		119	53 - 123
1,2,3,6,7,8-HxCDD	2000	2440		pg		122	66 - 122
1,2,3,7,8,9-HxCDD	2000	2500		pg		125	63 - 130
1,2,3,4,6,7,8-HpCDD	2000	2180		pg		109	70 - 119
OCDD	4000	4490		pg		112	65 - 137
2,3,7,8-TCDF	400	387		pg		97	61 - 119
1,2,3,7,8-PeCDF	2000	2000		pg		100	66 - 125
2,3,4,7,8-PeCDF	2000	2020		pg		101	61 - 124
1,2,3,4,7,8-HxCDF	2000	1970		pg		98	62 - 130
1,2,3,6,7,8-HxCDF	2000	1860		pg		93	58 - 141
2,3,4,6,7,8-HxCDF	2000	1950		pg		97	59 - 149
1,2,3,7,8,9-HxCDF	2000	2060		pg		103	56 - 141
1,2,3,4,6,7,8-HpCDF	2000	2130		pg		107	68 - 124

Method: 8290 - Dioxins/Furans, HRGC/HRMS (8290) (Continued)

Lab Sample ID: G1H240000063C
Matrix: Wipe
Analysis Batch: 1236063

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 1236063_P

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits		
1,2,3,4,7,8,9-HpCDF			2000	1910		pg		96	62 - 129		
OCDF			4000	4340		pg		109	70 - 130		

Internal Standard	*LCS % Recovery*	*LCS Qualifier*	*Limits*
13C-2,3,7,8-TCDD	*69*		*40 - 135*
13C-1,2,3,7,8-PeCDD	*74*		*40 - 135*
13C-1,2,3,6,7,8-HxCDD	*71*		*40 - 135*
13C-1,2,3,4,6,7,8-HpCDD	*71*		*40 - 135*
13C-OCDD	*68*		*40 - 135*
13C-2,3,7,8-TCDF	*74*		*40 - 135*
13C-1,2,3,7,8-PeCDF	*79*		*40 - 135*
13C-1,2,3,4,7,8-HxCDF	*82*		*40 - 135*
13C-1,2,3,4,6,7,8-HpCDF	*75*		*40 - 135*

8

QC Association Summary

Client: R J Lee Group Inc

TestAmerica Job ID: G1H220451

DIOXIN

Analysis Batch: 1236063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
G1H220451001	3078518	Total	Wipe	8290	
G1H220451002	3078526	Total	Wipe	8290	
G1H240000063B	Method Blank	Total	Wipe	8290	
G1H240000063C	Lab Control Sample	Total	Wipe	8290	

Prep Batch: 1236063_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
G1H220451001	3078518	Total	Wipe	8290	
G1H220451002	3078526	Total	Wipe	8290	
G1H240000063B	Method Blank	Total	Wipe	8290	
G1H240000063C	Lab Control Sample	Total	Wipe	8290	

Lab Chronicle

Client Sample ID: 3078518
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 09:00

Lab Sample ID: G1H220451001
Matrix: Wipe

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total	Prep	8290			1236063_P	08/22/11 11:00	EN	TAL WSC
Total	Analysis	8290		10	1236063	08/25/11 08:55	SHK	TAL WSC

Client Sample ID: 3078526
Date Collected: 08/18/11 00:00
Date Received: 08/19/11 09:00

Lab Sample ID: G1H220451002
Matrix: Wipe

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total	Prep	8290			1236063_P	08/22/11 11:00		TAL WSC
Total	Analysis	8290		10	1236063	08/25/11 09:47	SHK	TAL WSC

Laboratory References:
TAL WSC = TestAmerica West Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: R J Lee Group Inc

TestAmerica Job ID: G1H220451

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica West Sacramento		USEPA UCMR		CA00044
TestAmerica West Sacramento	A2LA	DoD ELAP		2928-01
TestAmerica West Sacramento	Alaska	Alaska UST	10	UST-055
TestAmerica West Sacramento	Arizona	State Program	9	AZ0708
TestAmerica West Sacramento	Arkansas	State Program	6	88-0691
TestAmerica West Sacramento	California	NELAC	9	1119CA
TestAmerica West Sacramento	Colorado	State Program	8	N/A
TestAmerica West Sacramento	Connecticut	State Program	1	PH-0691
TestAmerica West Sacramento	Florida	NELAC	4	E87570
TestAmerica West Sacramento	Georgia	State Program	4	960
TestAmerica West Sacramento	Guam	State Program	9	N/A
TestAmerica West Sacramento	Hawaii	State Program	9	N/A
TestAmerica West Sacramento	Illinois	NELAC	5	200060
TestAmerica West Sacramento	Kansas	NELAC	7	E-10375
TestAmerica West Sacramento	Louisiana	NELAC	6	30612
TestAmerica West Sacramento	Michigan	State Program	5	9947
TestAmerica West Sacramento	Nevada	State Program	9	CA44
TestAmerica West Sacramento	New Jersey	NELAC	2	CA005
TestAmerica West Sacramento	New Mexico	State Program	6	N/A
TestAmerica West Sacramento	New York	NELAC	2	11666
TestAmerica West Sacramento	Oregon	NELAC	10	CA200005
TestAmerica West Sacramento	Pennsylvania	NELAC	3	68-01272
TestAmerica West Sacramento	South Carolina	State Program	4	87014
TestAmerica West Sacramento	Texas	NELAC	6	T104704399-08-TX
TestAmerica West Sacramento	US Fish & Wildlife	US Fish & Wildlife		LE148388-0
TestAmerica West Sacramento	USDA	USDA		P330-09-00055
TestAmerica West Sacramento	Utah	NELAC	8	QUAN1
TestAmerica West Sacramento	Virginia	State Program	3	178
TestAmerica West Sacramento	Washington	State Program	10	C581
TestAmerica West Sacramento	West Virginia	West Virginia DEP	3	334
TestAmerica West Sacramento	West Virginia	West Virginia DHHR (DW)	3	9930C
TestAmerica West Sacramento	Wisconsin	State Program	5	998204680
TestAmerica West Sacramento	Wyoming	State Program	8	8TMS-Q

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: R J Lee Group Inc

TestAmerica Job ID: G1H220451

Method	Method Description	Protocol	Laboratory
8290	Dioxins/Furans, HRGC/HRMS (8290)	SW846	TAL WSC

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL WSC = TestAmerica West Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: R J Lee Group Inc

TestAmerica Job ID: G1H220451

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
G1H220451001	3078518	Wipe	08/18/11 00:00	08/19/11 09:00
G1H220451002	3078526	Wipe	08/18/11 00:00	08/19/11 09:00

13

August 18, 2011

West Sacramento Laboratory
880 Riverside Parkway
West Sacramento, CA 95605
916.373.5600 Fax: 916.372.1059

Receiving Sample #3078518 and #3078526

Fabric swatch samples that are to be sent for dioxins/furans,

Analysis Request = Dioxins/Furans by HR-GC/MS, report results on total pg/sample and on a WHO TEQ/sample basis.

Please have all results reported to me and reference the RLH108271

Results are to be due Aug 26th 2011

We should process samples as we did many years ago for WTC Dust analyses.

14

Keith Rickabaugh
Technical Director, Materials & Analytical Services

RJ Lee Group, Inc.

www.rjlg.com

724.325.1776 Office
724.387.1841 Direct
724.309.6732 Mobile
724.733.1799 Fax

350 Hochberg Road | Monroeville, PA 15146

Received by Ardh 8/19/11 1020

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

LOT RECEIPT CHECKLIST
TestAmerica West Sacramento

CLIENT RJ Lee PM JK LOG # 72386

LOT# (QUANTIMS ID) G1H220451 QUOTE# 89385 LOCATION W23A

Checked (✓)

DATE RECEIVED 8/19/11 TIME RECEIVED 700 ☐

DELIVERED BY ☑ FEDEX ☐ ON TRAC ☐ OTHER

☐ GOLDENSTATE ☐ UPS ☐ EZ PARCEL

☐ TAL COURIER ☐ TAL SF ☐ CLIENT ☑

SHIPPPING CONTAINER(S) ☐ TAL ☑ CLIENT ☐ N/A ☑

CUSTODY SEAL STATUS ☐ INTACT ☐ BROKEN ☑ N/A ☑

CUSTODY SEAL #(S) NA

COC #(S) NA ☑

TEMPERATURE BLANK Observed: NA Corrected: NA

SAMPLE TEMPERATURE - (TEMPERATURES ARE IN °C)

Observed: 2 3. 23 Average 23 Corrected Average 23

LABORATORY THERMOMETER ID:

IR UNIT: #4 ☑ #5 ☐ ☐ OTHER _____ ☑

JS Initials 8/19/11 Date

---

pH MEASURED ☐ YES ☐ ANOMALY ☑ N/A ☑

LABELED BY..... ☑

LABELS CHECKED BY..... ☑

PEER REVIEW _____ ☐ NA

SHORT HOLD TEST NOTIFICATION

SAMPLE RECEIVING ☑

WETCHEM ☑ N/A ☑

VOA-ENCORES ☑ N/A ☑

☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL ☑ N/A ☑

☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES ☐ N/A ☑

☐ CLOUSEAU ☑ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☐ N/A

☐ WET ICE ☐ BLUE ICE ☐ GEL PACK ☑ NO COOLING AGENTS USED ☐ PM NOTIFIED

JS Initials 8/19/11 Date

Notes _____

*1 Acceptable temperature range for State of Wisconsin samples is ≤4°C.

14

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Bottle Lot Inventory

Lot ID: GIH220451

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VOA*																				
VOAh*																				
AGB																				
AGBs																				
250AGB																				
250AGBs																				
250AGBn																				
500AGB																				
____AGJ																				
500AGJ																				
250AGJ																				
125AGJ																				
____CGJ																				
500CGJ																				
250CGJ																				
125CGJ	\	\																		
PJ																				
PJn																				
500PJ																				
500PJn																				
500PJna																				
500PJzn/na																				
250PJ																				
250PJn																				
250PJna																				
250PJzn/na																				
Acetate Tube																				
_____*CT																				
Encore																				
Folder/filter																				
PUF																				
Petri/Filter																				
XAD Trap																				
Ziploc																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

h = hydrochloric acid s = sulfuric acid na = sodium hydroxide n = nitric acid zn = zinc acetate

Number of VOAs with air bubbles present / total number of VOA's

14

QA-185 5/05 EM

Page 3

08/30/2011